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### Improved Ice House.

In these torrid days the very thought of ice is agreeable, and refrigerators or similar apparatuses, for preserving food cool and sweet, are not unpleasant topics of conversation.

The ice house here represented is intended for keeping large quantities of provisions in store for some time without allowing it to come in contact with the ice, or even be in the same inclosure with it. This ice house is intended principally, for use in hotels, restaurants, on board steamers, etc. It has been tried, practically on a large scale, and found to answer well. The idea is to ventilate the compartment in which the articles to be kept are placed so that the vapors, odors and gases, if any, pass off freely by one outlet and are succeeded or displaced by a current of cold air which pervades the apartment and keeps a pure dry atmosphere at all times. Fig. 1 shows a section vertically, and Fig. 2 one transversely. As cold air falls naturally, being heavier than warm air, the ice is placed in the upper compartment, A, and the food in the lower one, B, as shown. Between the two there is a floor which is slightly inclined and fitted with a water-proof filling, C, which prevents the ice either from leaking or condensing moisture to form on the ceiling below. This floor is likewise inclined slightly, and has strips at the side so as to cause the water from the ice to run off to the front where it is received in suitable vessels. The upper part of the lower chamber has a flue, D, through which the warm air and vapors aforesaid ascend to the ventilators, E, on top, and the air that enters the lower compartment, when it is opened to remove the articles, finds its way out again through the same channel.

The aprons, F, are an important feature of this ice house, for they prevent the two currents from mingling or coming in contact when in the course of changing. The cold air descends through the spaces, G, as shown by the arrows, while the warmer air rises through the flue previously indicated.

This ice house is constructed on philosophical principles and will answer the purpose for which it was designed.

A patent is now pending on it through the Scientific American Patent Agency by J. Hyde Fisher; address him for further information Box 2,730, Chicago, Ill.

*Fig. 1*

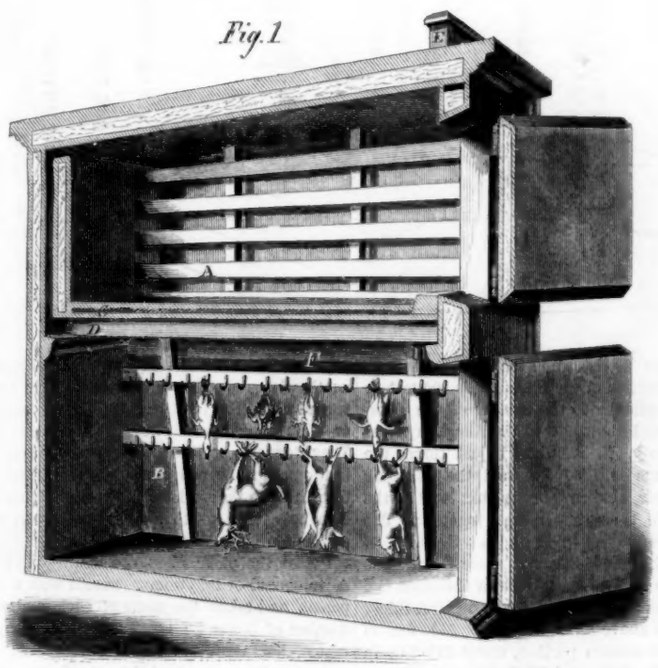
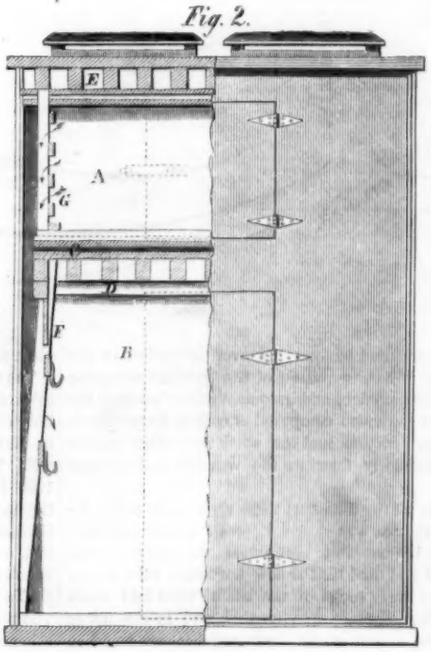



*Fig. 2.*




FISHER'S ICE HOUSE.

### A Steam Flying Machine.

A flying machine of novel form is now in process of construction at Hoboken, for the United States Government. It was commenced during the war, and was intended for use in aerial reconnoissances of the enemy's position. The war is over, but the machine is going on till its success or failure is an established fact. The idea of the invention is an old one, but this is the first time that an attempt has been made to put it into practice. The government was induced to embark in the enterprise upon the strength of certain experiments made by the late distinguished General (and Professor) Mitchell. He had long been interested in the subject of aerial navigation, and believed that the principle of screw propulsion could be made to work in air as well as in water. His first and only point was to demonstrate the lifting power of a screw fan moving horizontally at different rates of speed. The experimental fan was placed upon a pole as an axis, up and down which it could move freely. The fan was then made to revolve at various rates of speed at the pleasure of the operator. At one rate it would merely lift itself; at another rate it would raise twice its own weight; at another three times; and so on, until the fact was ascertained by comparison that a fan with blades of 20 feet diameter, revolving at a certain rate of speed, would raise six tuns, and have considerable power to spare. It is only a child's toy upon a large scale. We see every day in the streets toy venders who give a quick twirl with a string to a little fan upon a stick, and lo! it shoots into the air to a height of 20 or 30 feet, and descends slowly, still revolving as it comes down. The government toy—as some persons will probably call it—is a cigar-shaped canoe, built of copper, with iron ribs. An engine is placed in the centre with sufficient power to work a screw fan with 20 ft. blades. There are four fans connected with the engine,—one below, one above the canoe, and one at each end. The upper and lower fans are worked together to produce an ascent; and the terminal fans are made to revolve together or separately in the same direction, or in opposite directions, for the purpose of propelling the craft horizontally. The weight of the whole, fully equipped and manned, is about six tuns. It is claimed by those upon those recommendation the machine is constructed, that it can be guided through the air with as much ease as a vessel through the water. This is conditional of course to some extent upon the wind. If a vessel can be propelled through still air at a given number of miles per hour, it may be made to stem a wind of an equal number of miles per hour. If the power of a head wind exceeds or is less than the propelling power, the machine actually falls back or progresses in exact proportion to the difference between the powers. This truth should be borne in mind in considering all schemes for air-sailing.

An accomplished government officer is superintending the work, and hopes to have it done in a month, when the pretensions of the new flying machine will be tested.—*Journal of Commerce.*

We are pleased to learn that the estate of the late President Lincoln is in much better condition than many persons were led to believe. It now appears that he had some $75,000 invested in Government securities.

## THE PETROLEUM ROCKS.

BY R. P. STEVENS, M. D.

If half a dozen saucers be placed one within another, and the edges ground down nearly to a level with the middle of the upper saucer, we shall have an illustration of the position of the several layers of rocks that form the basin in which our petroleum is found. This may serve indeed as an illustration of most of the rock formations that make up the crust of the earth, for, as they have generally been deposited in the bottoms of lakes or seas, they exist in the form of basins. The illustration does not present an exact parallel, as the rock basins are irregular in their outline, and unequal in the thicknes of the several strata, as compared with each other, and in that of the different parts of the same stratum.

The basin in which petroleum is found embraces Lake Erie, the western part of Pennsylvania, and portions of Kentucky, Virginia and Ohio. The rocks were deposited in the bottom of an ocean which was bounded by land on the north and east, and was open to the south and west. The materials for these deposits were obtained by the wearing away of the eastern mountainous shore of the ocean, and they were distributed by currents over the bottom of the sea; they are consequently of the greatest thickness at the eastern edge, and become thinner towards the west; they are also composed of coarse fragments in the eastern portion, and the sand and other matter grows regularly finer in the western and thinner strata.

During all the time that these rocks were being deposited the sea was swarming with fishes, and their bones in innumerable multitudes are mingled with the sand and mud that is now hardened into stone. After the lower rocks of the basin were laid down amphibious animals were created, and in the upper and more recent rocks their remains are found in great numbers mingled with those of fishes.

Prints of seaweeds are found in all the formations, but while the lower rocks contain no trace of any land plant, the vast coal deposits of the upper series have been formed by the decomposition of peat and marsh vegetation.

The accompanying diagram represents a vertical section through the basin, along the crooked line of the principal borings. The lowest formation in which oil occurs in paying quantities is the corniferous limestone, so called because it contains nodules of hornstone, or flint. This is that ancient coral reef which was built up immeasurable ages ago in the warm and shallow waters along what was then the southern shore of the North American continent. It can now be traced along the southern shore of Lake Ontario, the northern shores of Lakes Huron and Michigan and northwestward far towards the Pacific.

Next above the corniferous is the Hamilton formation, which furnishes the flagstones for our sidewalks. The rich oil wells of Enniskillen, in Canada, are in the corniferous and Hamilton rocks.

Next is the Portage group of sandstones, the rim of the deposit coming to the surface along the southern shore of Lake Erie, where oil has been found in this rock.

Continuing upward we now come to the Chemung group of rocks, in which seven-eighths of our petroleum is found. The rim of this deposit is traced nearly around the basin, extending south of the Portage a little inland from the shore of Lake Erie, bending southward through Ohio and Kentucky, and reappearing in several folds on the western slopes of the Alleghanies. The wells of Oil Creek are in the lower portion of the Chemung, those of Tidioute and Economite, in the middle portion, and those of Mecca and northeastern Ohio in the upper portion. The rocks of this group are mostly alternate layers of sandstone and soft slate or shale.

The interior of the basin is filled with the carboniferous, or coal deposit. The coal occurs in smaller basins, which might be represented in our illustration by tiny saucers set within the upper of the larger ones, the spaces above and below the basins of coal being filled with clay and sandstone, the last deposits upon the bottom of this sea, before the slow upheaval of the continent lifted it from the waters, and it became dry land.

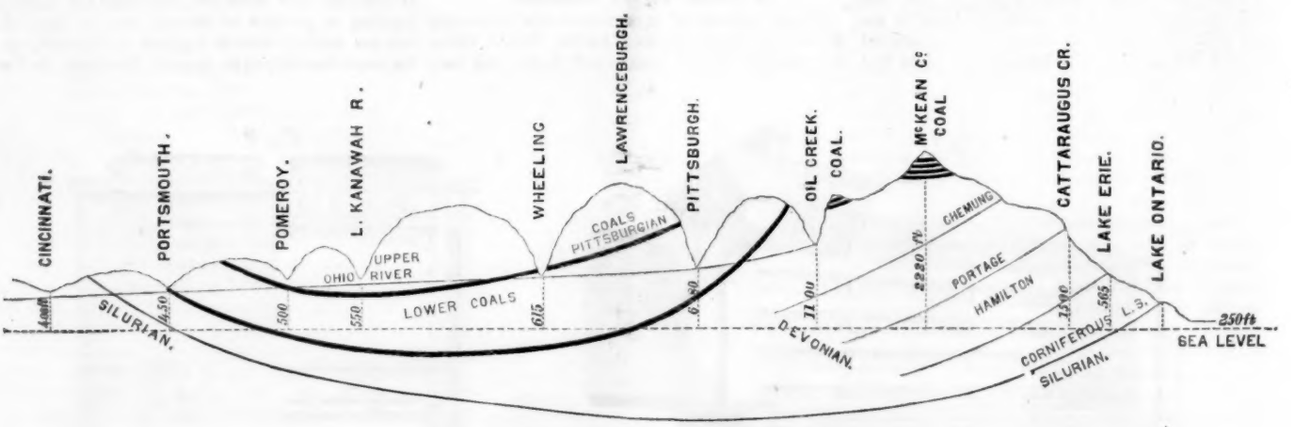
The wells of Smith's Ferry and Beaver R. oil are in the lower carboniferous; those of Dunkard Creek, Fayette and Green County, Penn., are in the middle carboniferous; and the shallow wells of West Virginia and Marietta district are in the upper coals.

The Catskill portion of the Chemung is 800 feet in thickness, perpendicular to the strata, on the Catskill mountains, and thins out to the Alleghany river in McKean county, N. Y., where it just tinges the soil. The Portage is 1700 feet, and the Chemung 1200 feet in their eastern portion, but east of the Cuyhoga River in Ohio they merge together. The Genesee slate is 300 feet thick on the Genesee, 30 feet on Lake Erie and does not reach Ohio. The Hamilton group is 1000 feet thick in Hamilton Co. N. Y., and in Canada at the west only 150 feet thick. The whole of the above series are about 6500 feet in thickness in their eastern portion, about 600 feet in Portsmouth on the Ohio, and 50 feet on the Mississippi.

The three sandstones of Oil Creek are local deposits of very small extent, and it is labor lost to sink wells in Ohio in search of the "third sandstone." Those Canadian borers who regard the corniferous limestone as the mother of oil, and who are sinking wells at Oil Creek in search of that formation, are also doomed to disappointment.

The slow upheaval of the continent continued after the middle of the great basin was raised above the ocean, and it is now 800 feet above the level of the sea. Neither was the work of creation suspended; as the seas were inhabited by successive species of fishes and amphibians, so the vast plains have been the abodes of successive species of land animals, which have one after another become extinct. Even since the advent of man this order of succession has been continued. We know that the race of mound builders, with their skill in working copper, were succeded by the more savage and warlike Indians, whose best implements were made of stone, and these have been swept away by a race who read the SCIENTIFIC AMERICAN, and discuss the problems of aerial navigation and the conservation of force.

In the slow oscillations of the earth's crust, perhaps some millions of years hence these plains of waving grain may be again lowered beneath the level of the sea, the waters may then be inhabited by new species of fishes yet to be created, and ships, propelled by engines at present undreamed of, may navigate the surface of a stormy ocean a thousand fathoms above the submerged ruins of Pittsburgh and Cincinnati.




### The Strawberry Harvest.

The importance of this crop has increased greatly of late, and horticulturists are sedulously engaged in developing its best qualities. The scenes during the harvest are animated, and are thus described by the *Circular:*—

"Up early and late—men, women, boys and little children, Community folks and village folks, riding, driving and railroading, night and day, and all about strawberries. For why? Because there are five acres of the crimson, juicy fruit-cones, on which sun and dew are pouring their final ripeness, and which are to be picked now or never, and got to the waiting appetites and teaspoons of our city cousins. Come on and at five in the morning we will commence. The crates and boxes, cart-loads of them, are on the ground at the border of the field, where the long rows of emerald leaves stretch away, embroidered underneath with red. The crowd seize their boxes and spread along the border, each person taking a row, or if the plants are in beds, two persons to a bed. They toss two or three empty boxes ahead of them in the path to be convenient when wanted, and getting down to the work begin to move across the field. Now be careful not to step on the green fruit, and not to injure the vines.

"Soon the pickers begin to return with full boxes. A tallyman, or tallywoman, stands with a book and pencil, and takes the name of each, and scores the number of boxes he returns. They are placed in crates, holding from thirty to seventy boxes, which as fast as filled are wheeled to the fruit-house, where the boxes are all taken out and leveled up, that is, packed as full with fruit as they will bear to carry. The picking continues three or four hours. Then the pickers are paid from the tallyman's book, and invited to be on hand at 3 o'clock in the afternoon. By 8½ or 9 o'clock, the morning's picking is all packed and carried to the station in readiness for the forenoon train. The greatest gathering is in the afternoon, at which time crates are made up for the night train and boat for New York. This keeps many of our people busy till 9 or 10 o'clock. Such are the scenes daily, of the strawberry harvest. This harvest is very exacting of immediate attention during its time, but it does not last but two or three weeks. Twice this week the daily picking has amounted to 2300 quarts, or over 70 bushels. The pay for picking ranges from 1½ to 2½ cents per box, at which rate some girls make 60 cents in four hours.

THE Paris papers notice a novel method of preserving ice, which is often required to be kept by people who are not provided with an ice-safe. Put the ice on a dish and cover it with a napkin, then set the dish upon a feather bed or pillow, and place another bed or pillow on the top of it. In this way it is said, a few pounds of ice may be kept for a week.

## A MANUFACTORY OF ANILINE DYES.

On the 28th of January, 1860, we published a full account of the method of making aniline dyes from coal tar, then just commenced on a commercial scale in France. During the five years that have since elapsed these dyes have become known throughout the civilized world under the names of Magenta, Solferino, and others, and have been universally admired for their delicacy and brilliancy. The attention of the most eminent chemists has been directed to the production of different colors, and now, not only the primitive colors, red, yellow and blue, but all the others resulting from a combination of the primitive are obtained from that vile substance, coal tar, and all of the purest, deepest, and most perfect quality.

We now announce the establishment of the first manufactory of these dyes in the United States. Messrs. Thomas and Charles Holliday have commenced the business in the suburbs of Williamsburgh, on Long Island, and we have been favored with a look at their works. After wandering about for a while among the dirty manufactories for which Newton Creek is famous, we came upon a brick building, and saw a workman standing in the door way. As soon as our eye fell upon this man we saw that we had discovered the establishment that we were in search of, for he was dyed from the crown of his head to the ends of his fingers with all the colors of the rainbow. His hair was shaded from a dark purple to a delicate violet, his thumbs were yellow bronze, the backs of his hands were bright red, his nose was Magenta, and when he opened his mouth he displayed his tongue of the deepest and most brilliant Solferino. All the people at work in the establishment were indelibly marked with the same varied and resplendant hues.

When bituminous coal is subjected to the cherry-red heat of the gas retort, it undergoes destructive distillation, the combination of oxygen, hydrogen, nitrogen and carbon which forms coal being broken up, and these elements entering into new combinations to form a great number of new substances. Some of these substances are permanent hydro-carbon gases, which are used for illumination, while others on the reduction of temperature are condensed into solids and liquids, which are mixed together as coal tar. One of the liquids, though a very volatile liquid is benzole. If benzole is mixed with strong nitric acid, a new chemical compound is formed, which is called nitro-benzole. Then if this is subjected to the action of nascent hydrogen, aniline is produced.

Benzole is composed of, carbon 12 atoms, and hydrogen 6.

Benzole $C_{12}\ H_6$

When nitric acid, $NO_5$, is added, the acid loses one equivalent of oxygen, becoming $NO_4$, and this is substituted for one equivalent of hydrogen.

Nitrobenzole $C_{12}\ H_5\ NO_4$

Then by contact with nascent hydrogen the 4 atoms of oxygen are displaced by 2 of hydrogen, and we have

Aniline $C_{12}\ H_7\ N$

The discovery that aniline can be made from benzole is one of the most valuable chemical discoveries of the century, for it has revolutionized the important art of dyeing.

After the aniline is formed the various colors are produced from it, principally from oxidising it, which is effected by treating it with nitrate of potash, chlorate of potash and other compounds that hold oxygen by feeble affinity, and therefore surrender it readily to other substances with which they are brought in contact.

The apparatus required is a large retort, a steam boiler for heating it, and an immense supply of vats, for the purification and crystalization of the solutions. There is not much machinery, but a great deal of apparatus, and plenty of time required for the product. It is estimated that 30 cwt. coal yields 18 lbs. naptha, which gives 6 lbs. benzole, which gives 5 lbs. aniline, which gives 1 lb. Magenta. 1 lb. of Magenta will dye 600 lbs. of silk, or 900 lbs. of wool. Magenta, which in solution is a beautiful purple, is in the solid crystal a bright bronze green.

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SINCE the suppression of the rebellion 160,000 troops have left Washington for the north and west.

## BROUGHTON'S GLASS TOP OILER.

The floor around an oil tank in a machine shop or factory, is continually slopped with oil, so that in a short time it becomes actually rotten. This is evidence of great waste and recklessness, for it is caused by carelessly filling oil cans, so that a quantity runs over and is wasted in the manner described. The common funnel is but a partial protection against this loss, for the spout of it fills the hole in the oil can tightly, while the funnel is full, the air is prevented from escaping, and if precaution is not taken the oil will be spilled after all.

The engraving published herewith represents an oiler which is completely guarded against loss from overflow; moreover, it always has a funnel with it, so that the oil may be run in and yet allow the air to escape at the same time. When the can is full it may be seen at a glance in time to prevent any loss from overflow. This can also shows the quantity remaining in it at any time. By tipping it up more or less the glass globe will be filled immediately and without leakage.

The glass is extra heavy, annealed and made strong to resist an accidental blow, and the brass bottom is double spring and tinned throughout, to prevent the formation of verdigris. For sewing machines or cotton factories, or in any place where cleanliness is desirable, these oil cans will prove useful and economical.

It was patented March 7, 1865, and is manufactured by Broughton & Oakman, 41 Center street, New York; address them at that place.

## A Pickpocket Catcher.

A few days ago an Englishman went to Paris to take out a patent in France for an invention to detect pickpockets. He entered an omnibus and sat by the side of an elegantly dressed lady, with a very charming face. Soon the Englishman saw an expression of distress and dismay come over that face, and felt a tugging at his pocket. With a cruel smile he looked at the fair creature, who, crimson with shame, implored him to let her go. He released her hand, and she thereupon stopped the omnibus, leaped out, and ran down the street with most unfeminine speed. The Englishman was highly pleased at the success of his device, which consists of a strong calico diaphram stretched across the pocket with an India rubber opening that expands to permit the entrance of a strange hand, but will not do so to permit it to withdraw.

[We have heard of a sailor who lined his pockets with fish-hooks, barb down, so that any one could pass the hand in, but would be unable to pull it back. Tradition asserts that the first one he caught was himself.—EDS

## Trial of a New Cannon.

A very interesting trial of a small and novel rifled cannon is in progress at the water-shops, under Major Laidley's direction. The piece weighs only 167 pounds, yet has endured, without apparent injury, a test with a charge of powder and projectile such as are fired ordinarily from guns weighing over 800 pounds. Nearly 500 shots were fired with it, the charge being a pound of powder and a projectile weighing 7¾ pounds; and the charge has been increased to a pound of powder and a projectile weighing 10¼ pounds, ten charges of this kind having already been fired. About 200 more will be, if the gun holds together so long, as it undoubtedly will, and further testing then will be considered a waste of powder. The remarkable and previously unheard-of strength secured in this piece comes from a peculiarity of its construction. The core of the gun is bronze, which after the 2½-inch bore is made is only about a quarter of an inch thick. On the outside of this core or cylinder fine steel wire is tightly wound to the depth of an inch. The wires pass over diagonally, each successive layer being at right angles with the previous one. After this winding was completed, when the gun was manufactured, it was heated to a high temperature and then plunged into a quantity of molten bronze. The final result is a piece which it is impossible to burst except with a most extravagant and enormous charge, this great strength being secured by the new process of winding the wire as stated. The obvious disadvantages of a piece weighing so little, while possessing the capabilities of one weighing five times as much, is the immensely increased recoil. If this can be overcome in a measure, which is not improbable, and this mode of construction is found to work equally well with large as with small guns, the invention will undoubtedly effect a revolution in the artillery and heavy ordnance of this country, if not of the world. The inventor is Dr. Woodbridge, of Little Falls, N. Y., who was one of the first to discover the advantages which might be obtained by rifling cannon and small fire-arms, and who has made several valuable inventions in different departments of mechanics. The trial of his new cannon, the first one manufactured, is made by order of Gen Dyer, Chief of Ordnance, who will see that the governments loses no time in taking advantage of the invention if it proves all that it now promises.—*Springfield Republican.*

## New Way of Shaving Notes.

We have noticed in circulation several fifty-dollar Government notes from which the interest coupons have been cut off. These notes were issued August 15, 1864, and have three years to run, with 7 3-10 per cent interest, payable semi annually. These notes are not a legal circulating medium, and with the coupons detached cannot be sold except at a shave of three years' interest. This is a petty swindle, and the public ought to be very careful to examine these Government interest-notes to see if the coupons are attached before taking them. The fifty-dollar *compound interest notes* have no conpons attached, but these 7 3 10-interest notes specify at the bottom of the note as follows:—"Five coupons attached. Last six-months' interest payable only on presentation of coupons therefor."

## Personal.

In our issue of April 22d we published a report that James E. A. Gibbs, the inventor of an improved sewing machine, was chief of the rebel torpedo corps. Mr, Gibbs has called upon us since and denies that he had anything to do with the manufacture of torpedoes. Mr. Gibbs is a native of Virginia, where he resided at the outbreak of the rebellion, and his papers show that he was a conscript in the rebel service, and was employed in the Niter and Mining Bureau, at Staunton, Va. Mr. Gibbs has taken the oath of allegiance to the United States Government.

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BARON LIEBIG is engaged, through the corporation of London, in a controversy upon the question whether grass will grow upon sea-sand if nutriment be supplied in solution. The corporation proposes to grow Italian rye-grass on the English sands by impregnating the sand with London sewage in solution; but Baron Liebig tells the Lord Mayor that the scheme is not feasible.

## Correspondence

### Leather Belts.

MESSRS. EDITORS:—I notice in your issue of the 3d inst. a few editorial remarks on leather bands, concluding with an invitation to those who possess facts connected with this subject to communicate them. I notice also that these remarks are followed by a more general invitation to write letters, coupled with the assurance that when sent to you in good faith they will be received and placed in such light as to benefit your readers and our fellow-workers. I have collected a few notes on this subject, which I here give:—

The width of a certain belt is 18 inches; speed of same, 1,500 feet per minute; angle of belt with horizon, 45°; distance between centers of drums, 25 feet; diameter of driving drum, 8 feet; diameter of driven drum, 4 feet. When this belt transmitted 20-horse power it worked quite freely; when the power was increased to 25-horse it was necessary to make the belt quite tight, and when the power was increased to 28-horse it was necessary to apply a tightening pulley, which caused the journals of the driven shaft to "heat."

From the above data I have deduced the following formula, which will serve as a guide for determining the width of belts:—

$$\frac{\text{H P} \times 3\frac{2}{3}}{\text{Di. small pulley in ft.}} = \text{width of belt in inches.}$$

If we assume this belt to transmit 22½ horse power we shall then have a constant travel of 100 square feet of belt per horse power per minute.

An 8-inch belt running 100 feet per minute will give one horse power. Hence we have

$$\text{B} = \frac{\text{P} 800}{\text{V}}$$

$$\text{P} = \frac{\text{BV}}{800}$$

$$\text{Y} = \frac{\text{P} 800}{\text{B}}$$

This rule gives 66⅔ square feet per minute per horse power.

One hundred square feet of belt per minute per horse power is considered an ample allowance; in many cases one-half will be sufficient.

A 12-inch belt running on a 5½-foot pulley, at 45 revolutions per minute, will carry away 12 horse power. This rule gives 64 square feet of belt per minute per horse power.

$$\text{W} = \frac{350 \text{ H P}}{\text{D} \times \text{rev. per min.}}$$

In which W=width of belt in inches, and D=diameter pulley in feet. This rule gives 91·63 square feet per minute per horse power, and 30 pounds per inch width of belt.

Averaging these rules, we have about 80 square eet of belt per minute per horse power.

Experiments have been made to test the comparative "slipping" tendencies of leather and vulcanized rubber belts, which proved the superior adhesive qualities of the leather, but did not go any farther. It is not adhesion alone we want to prove the better belt; beyond a certain amount it is rather an injury to the belt than an advantage in its use, for "slipping" is to be preferred to abrasion, when rapid destruction of the belt would result from the closeness of its sticking—an infirmity to which rubber belts are liable.

Belts which are repeatedly shifted should be of good leather, as the edges are almost constantly rubbing against the shifting device, and if of rubber they will wear away with great rapidity.

There is a very unsatisfactory incompleteness of the data given in the notice of some experiments; for instance, the belt in rule (1) above; the material of which it is made is not mentioned, nor is a word said on the nature of the surface upon which it runs. The adhesion to wood and to iron are very different and the magnet has much to do with adhesion. And further, it is not stated whether the nominal or actual power of the engine is meant where the term horse-power is used.

It is a fact worthy of record that, under the circumstances named the "leather belt or iron pulley slipped with 48 lbs.," while "rubber belt on iron pulley slipped with 90 lbs." But of what use is the isolated fact when we do not know whether the leather belt was new or had been sufficiently used and greased to render it pliable and adhesive. Does not velocity introduce new circumstances of slippage and efficiency which trials, at rest, can never show? Practice is inexorable and experiment, *per se*, is not the thing for scientific artisans to base their calculations upon.

I would suggest that every successful transmission of power by belts, where the nature of the case is of sufficient importance to warrant a record, that a complete and faithful record be made and placed in the proper channels of instruction for the benefit of every artisan and engineer.

J. H. COOPER.

Philadelphia, Pa. June 12, 1865.

[We are obliged for this letter and for others on this subject received but not published. The difficulty alluded to in our article of estimating exactly what power is transmitted by a belt is not solved by our correspondent's communication, although he gives so much that is interesting, and is a thinking man. He assumes that the belt (rule 1st,) gives or transmits 22½ H P, but is this an inference or the result of actual experiment, or practice, which is better? A belt transmitting 22½ H P will have to raise 742,500 lbs. at the rate of one foot high in a minute, and that the force exerted is materially changed by the conditions the belt works under is very certain from the data furnished by Mr. Cooper.

A 12-inch belt running on a 5½-foot pulley at 45 revolutions per minute would be very slack not to transmit more than 12-horse power. We know of an 11-inch belt that daily transmits, from a 4-foot pulley running 60 per minute, the power exerted by an 11-inch cylinder and 30-inch stroke running 45 revolutions per minute with 50 pounds of steam. In this comparison the advantage is with the 5½-foot pulley, for the speed of the belt over it, in lineal feet, is 780, while the smaller pulley runs 753 feet per minute. The power thus carried off by this belt (vertical) without an idler pulley is, by the rule for estimating the powers of steam engines, 29-horse power.

Let it be understood that we do not criticise our correspondent's letter in a spirit of fault-finding, but with a view to further information in the case.

On page 84, Vol. III., of the SCIENTIFIC AMERICAN, we published some interesting rules and facts relating to the transmission of power by belts, and the opinion is there expressed that but little reliance can be placed on rules in general, for so much depends on the elasticity, length of belt, and velocity of the same, that arbitrary formulæ do not always suit the case. We are not of this opinion now, and see no reason why, when the length and width of the belt is given, we should not have an approximately correct result, with the ordinary tension, that is a stretching that that will neither tear out the lacing, or the holes, or heat the shaft, but be sufficient to cause a moderate and proper adhesion. Of course, in this case, common sense must be used to determine what reasonable tension means.

As our correspondent remarks, the experiments with the india-rubber and the leather belts proved nothing. Mere adhesion of two surfaces, or one slipping under a less load than the other, with the same width, is no criterion, for by applying foreign substances, such as rosin or oil and rosin, the adhesion can be greatly increased, and a small belt made for the time to draw as much as one of greater sectional area.

We shall be glad to receive further communications on this subject, and thank Mr. Cooper for his promptness in responding to our request.—EDS.

### Mr. George Parndox Hill's Paradoxical Power.

Notice is hereby given that the "Union Engine and Paradoxical Power Wheel" is a device by which motion can be perpetuated with surplus power. The method of this device is to suspend a weight so that its bearing will drive a reel with one half of the force of the weight used. A reversed forced action maintains the suspension and prevents the weight from falling.

Being fully persuaded that the Eternal Source of all good has only granted to me the knowledge of this invention and not the right of monopoly, I would respectfully request that all who are desirous of obtaining the benefit of the above-named device would investigate the plan and ascertain for themselves the value of its utility. To believe or disbelieve, to accredit or discredit, without the knowledge obtained by investigation is alike erroneous and unjust.

Your servant the inventor,

GEORGE PARADOX HILL.

Davenport, Ill., June 5, 1865.

P. S. The above notice is intended for the benefit of your readers, therefore please publish and oblige an inventor who is struggling for life against the will of popular strife. G. P. H.

### Philosophy of Sleep.

MESSRS. EDITORS:—Although I am a mechanic of nearly three score and ten, and somewhat unused to presenting communications of this description before the public eye, I feel encouraged to do so now in consequence of the terms offered in your late proclamation of amnesty to us of the file and plane, coaxing us to abandon our natural reserve, and become, by our contributions, helpers in forwarding a more perfect organization of society and science. I feel so especially as you promise to make yourselves responsible "that our thoughts shall be clothed in good apparel," before they are allowed to pass the inspection of your more enlightened readers.

My object, however, is not to write a disquisition on the subject indicated above, but rather a confirmation of what has been recently stated in articles by two of your correspondents, the last of which appeared June 10th, page 372, and in which the other is referred to.

The cause of wakefulness when we know that sleep is actually needed—at night or any other time—but, as with Nebuchadnezzar of old, our sleep goes from us, is simply thinking. At such times neither a peaceful conscience nor the rehearsal of that anonymous lullaby from the "New England Primer," "Now I lay me down to sleep, ect.," any number of times will induce that soothing restorer, sleep, to resume its sway over us until something is done to divert our minds from the besetting thought which is so pertinaciously keeping us unrefreshed; and the process of effecting this desirable result is clearly shown by the first writer, alluded to before. I have tried it myself for several years past and still continue the practice—except in meeting—always having found it effectual, without ever experiencing any inconvenience whatever, either physical or mental.

Boston, June 16, 1865. S. B. S.

[We have had no occasion to alter a line or a word in our correspondent's communication and we hope that other friends will act as promptly and forward us their experience in any branch of the arts.—EDS.

### Water Wheels by Night and Day.

MESSRS. EDITORS:—There is a mystery about a water-power that I cannot solve, nor have I seen any explanation by any scientific writer. Having heard that you answer more questions through your paper than any paper extant, I am prompted to ask you why water has more force on a water wheel at night than in day time? It is more perceptible in low water than high water, but no difference in summer or winter at the same stage of water.

J. H. T.

Cumberland Valley Mills, Pa., May 26, 1865.

[This question was asked us about five years ago, and we replied that, before attempting an explanation, the first point to be determined was whether there was any truth in the statement. After much discussion, we received a communication from a correspondent in East Pepperell, Mass., giving the details of an elaborate series of experiments undertaken by him to test the question, and he found that with the same flow of water the wheel would run no faster at night than in the day time. His communication was published on page 207, Vol. I., New Series.—[EDS.

### A Convention of Inventors.

MESSRS. EDITORS:—It has been a settled conviction with me for many years that the navigation of the air would some day be accomplished by flying machines or ships that would be practical and useful; and I believe that to be the next great work to be done by human invention and skill. I have noticed with

much interest anything pertaining to the subject; and from your article in the SCIENTIFIC AMERICAN of June 17, and Mr. Barbour's account of his carbonic acid engine, I think perhaps the time has come when there should be a combined effort made to accomplish so great an object. It is too much of an undertaking for any one to succeed in single-handed; but if all the best inventive genius, mechanical skill and engineering ability in the country will combine and organize a joint stock company for the purpose of experimenting and proving which is the best form of wheel, and testing and bringing together all the best plans for a flying ship, I have no doubt something would be accomplished. But it would be necessary to spend many thousands of dollars in experiments to ascertain the best forms for the machinery and the best motive power before it would be advisable to undertake the construction of a working machine, and by forming a stock company the necessary funds could be raised, and the best skill in the country employed to make the experiments, and finally construct a machine, which cannot be done by any individual alone.

If this plan should appear favorable to you, why not call a meeting in New York of all those interested, and those who believe in aerial navigation, to discuss the subject, and see, as Sam Patch said, "If some things cannot be done as well as others?"

GEORGE J. COLBY.

Waterbury, Vt., June 16, 1865.

[The plan does not appear favorable to us. Joint stock companies may be organized and money collected where there is a reasonable prospect of large dividends, but a joint stock company in a case where there is no possibility of either fame or profit to the individual subscribers must necessarily fail, because it is not in accordance with the constitution of human nature. We can conceive of no scheme more manifestly impracticable than a joint stock company of inventors, as each member would have an exalted idea of his own genius and of the value of his inventions, and a corresponding contempt for the talents and inventions of his associates.—[EDS.

### A New Process for the Extraction of Gold from Auriferous Ores.

MESSRS. EDITORS:—This process is particularly applicable to pyrite and other ores containing gold in small quantities, and has been invented by Messrs. Jackson & Ott, chemists, Raymond street, Brooklyn, The active agent in this process is the hypochlorous acid gas, which they prepare by forcing a stream of chlorine gas through a concentrated solution of sulphate of soda. For the application of the named gas to sulphurous ores, it is necessary that the latter contain a certain amount of sulpho-metals, thus allowing not a complete desulphurization. The gas in contact with the sulpho-metals is undergoing a decomposition, whereby the oxygen is united with the sulphur, transferring it in the highest degree of oxydation, while the chlorine is combined with the gold, forming soluble chloride of gold. From the process of Prof. Plattner in Freiberg (described in Muspratt), this method has particularly the advantages—first, that the chlorine is generated in its nascent state, and second, that it prevents any precipitation of gold (equal to a loss of gold), which by the application of chlorine alone will occur when not every trace of sulphur is removed from the ore.

Our process requires, like all others, a complete pulverization, and next a good roasting, if the ore should contain sulphur. In case the ores should contain copper, it would be advisable to submit them to a roasting process, and to extract the formed copper salt by water, and to precipitate the copper by proper means. In both cases the ore is ready for being treated by the hypochlorous acid gas.

The question now arises whether this gas can be produced at a sufficiently cheap rate. In view of the enormous quantities produced for the preparation of bleaching salts, and especially of hypochloride of lime, we can confidently give an affirmative answer. We do not need for our purposes any other apparatus or localities than those required for the manufacture of the before said articles, except a leaden retort, which should be placed between the generator of the chlorine and the buildings for the storage of the ores. This retort is filled with a solution of sulphate of soda or glauber salts, and we thus obtain the hopochlorous acid gas in a free condition.

The generator of the chlorine, in proportion to the impregnating chamber, requires smaller dimensions than those necessary for the manufacture of hypochloride of lime. The impregnating chamber is constructed of silicious sandstone or from bricks in a square form, and represents a room rather more high than wide. It must be coated inside with asphaltum, and boards eight to ten feet long and two feet wide should be fastened horizontally along the large sides, one above the other, allowing spaces of about four inches between them. These boards are designed for receiving the ore. In the middle of the building a small gangway is to be left; two windows allow to watch the operation, and one door affords admission to the chamber. A green color will be observed in the windows when the impregnation is completed, and the door, thus far tightly closed, then may be opened for the exit of the gas and the removal of the ore.

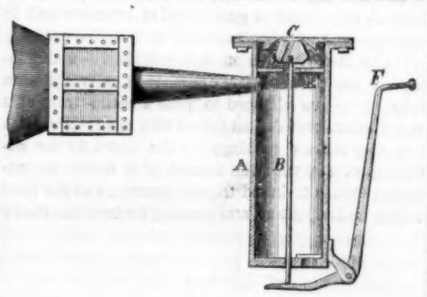
The next operation, i. e., the extraction of the ore, is performed either by centrifugal power or by a hydraulic press and water. In this manner we obtain a very concentrated lye, from which we precipitate the gold either directly by sulphate of iron, or by a treatment with sulpho-hydrogen, and subsequently by sulphate of iron. W. A. OTT.

Brooklyn, N. Y.

### Improved Tweer for Furnaces.

MESSRS. EDITORS:—I send you a pencil sketch of a tweer which we have been using in our water-wheel works for the past year. I send it to you for the benefit of your readers who use such things.

We have been much perplexed in trying to keep our fires clean while making large welds, especially those on which we had to "sand" in the fire. We have tried almost every imaginable device without effect; when, one day, seeing an old condemned pump cylinder lying beside the smith shop, we conceived the idea of this form of a tweer. We have tested it




thoroughly and find no fault in it. Appended is a description of it.

The cylinyer, A, is six inches diameter inside, and 17 inches deep. B is a rod running up through the center, carrying a cone-shaped head, D, on the top. The cap plate has a beveled hole, C, in the center, to receive a cone, D, when forced up to shut off the blast. This cone is made with less taper than the hole, C, so that the dirt and cinders will easily escape, and not lodge on its sides. There is a small hole drilled through the cone to let a stream of air through for light work. The rod, B, has a spider or cross on it to keep the cone in the center. By operating the handle, F, the fire can be cleaned in a moment and the blast regulated as desired. P. H. WAIT.

Baker's Falls Iron Machine Works, Sandy Hill, N Y., June 5, 1865.

## RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

*Lading and Unlading Device.*—This invention relates to a new and useful device for unloading, storing and loading freight, merchandise, etc., and has for its object economy in labor, the saving of time, and a greater facility than usual in removing goods from carts and trucks and the loading or placing of them thereon.

The invention consists in the employment or use of an elevated way or track arranged in such a manner that it may be inclined more or less from a horizontal plane, and using therewith a car with an adjustable platform suspended to it, whereby the desired ends are attained. Henry A. Whitney, New York city, is the inventor.

*Grain Hulling Machine.*—This invention consists in the employment or use of a rotary huller composed of one or more frustrums of cones placed or arranged within a conical shell and corrugated or fluted whereby the hulls or cuticles may be removed from grain very expeditiously and without breaking or crushing the same, as attrition produced by the rubbing of the grains in contact with each other, is depended upon for performing the work, and not the direct contact of moving surfaces with the grain such as corrugated plates and the like, hitherto employed. The invention is applicable to the huling of various kinds of grain, such as coffee, rice, etc. James H. Thompson, Hoboken, N. J., is the inventor.

*Ticket Box.*—The object of this invention is to protect railroad companies and others from fraud by the conductors which under the present arrangement are enabled to sell any number of tickets to passengers on the route and put the money in their own pockets without the possibility of being detected.

This difficulty is obviated by the use of the box which forms the subject matter of this present invention. The tickets are made in two sections one to be retained by the passenger and conductor and the other to be used as a check and to be returned with the box to the company. The tickets are enclosed in the box and they are so placed in relation to suitable knives or circular cutters that whenever one of them is withdrawn from the box, that portion which is intended to remain as a check, is cut off and retained in the box, while the other portion is handed to the passenger and afterwards taken back by the conductor. The tickets are also provided with a shoulder which serves to act on the clapper of a bell whenever one of the tickets is withdrawn from the box and thereby the attention of the passenger is called to the fact that the conductor has really taken the ticket from the box and not from any other receptacle. E. Hambujer, 18 Beekman street, New York City is the inventor.

*Artificial Leg.*—This invention consists first in sinking the part or parts of the thigh socket on which the hip bone rests so as to make it match all the points of such hip bone and to render the operation of fitting the same to the stump easier than with artificial legs of the ordinary construction; second in the application of double stops to the knee joint as well when the leg is in the standing as when it is in a sitting position, said double stops being produced by a stud rising from a horizontal platform below the knee joint and forming the bearing for the fulcrum pin of the same, said stud being brought in contact with the ends of slots in the lower end of the artificial thigh, and the other stops being produced by the shell of the leg itself in both positions in such a manner that the snapping of any part of the knee joint is prevented and a strong and substantial leg is produced. Third in the use of an elastic segment attached to the stud which forms the bearing for the fulcrum pin of the knee joint in combination with a spring fastened at one end to an arm which extends from each stud and at the other to the shell of the artificial thigh near the hough in such a manner, that by the combined action of each elastic segment and spring a soft cushion is produced when the leg is bent, and the operation of straightening the leg is facilitated. Fourth in the peculiar contractions of the ancle joint which is provided with two stops formed by the lower end of the artificial leg in combination with an abutment rising from the sole of the foot near the heel and with a spring extending from each abutment to the lower end of the leg in such a manner that the heel is varied when stepping or springing of the foot, and the motion of a natural foot is imitated. John J. Austin, New York City, is the inventor.

RECENT advices from England mention the death of Sir Joseph Paxton, the architect of the first Exhibition building in London, known as the Crystal Palace. He was employed as gardener to the late Duke of Devonshire, and had charge of the magnificent grounds of Chatsworth. He was at one time a member of the British Parliament, and rendered important services to his country in organizing the working corps of the Crimean army.

### Improved Water Wheel.

The patentees and proprietors of this wheel claim that it is one of the most efficient in the market. It is constructed in the most durable manner, of sound material, and is not liable to wear rapidly. It gives out a large percentage of the power of the water, and can be set in position in a short time. These wheels are manufactured of all sizes, and fourteen of them are now in use in Grands Rapids, Mich., besides in other parts of the country.

*Fig. 1*

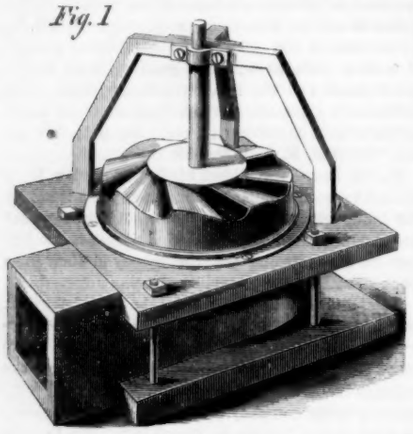
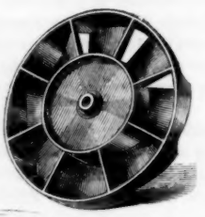


*Fig. 2*

*Fig. 3*



**SIMONDS'S AND GODFREY'S WATER WHEEL.**

The peculiarity of this wheel is, that the water enters at the bottom of it and discharges at the top, and that the buckets are so made as to adapt themselves to the velocity of the current as it impinges on them. The water enters through the scroll, A, and rising the spiral passage, B, strikes with its full force against the lower edge of the buckets, and finally issues through the top of the buckets to the exterior of the wheel.

Fig. 1 is an isolated view of the wheel; Fig. 2 is a view of the case, and Fig. 3 a view of the wheel with the bottom of the buckets exposed, showing their form. The water has free exit at each bucket, and the proprietors say it will run well through tail water. Respecting the performance, one of them—size not specified—grinds 14 bushels of wheat per hour, with 78 inches of water, under 14 feet head. Another wheel grinds 18 bushels per hour with 180 inches of water, under 8 feet head.

This wheel was patented by Simonds and Godfrey, of Grand Rapids, Mich., on Sept. 13, 1864; for further information address them at that place.

### Improved Gate Fastener.

In these several engravings we present views of an improved gate fastening which is self-acting. In detail it consists of a series of catches acted on by springs which, on being compressed, release the gate from the fastening. On relaxing the hold the gate fastens itself securely.

*Fig. 1*

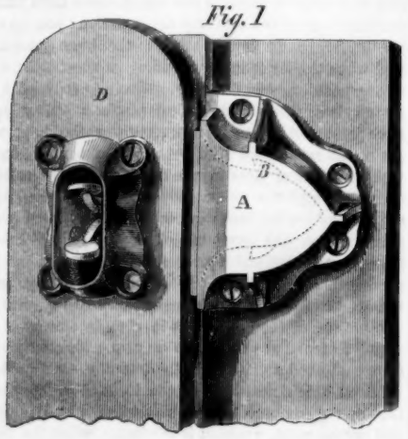



*Fig. 2*

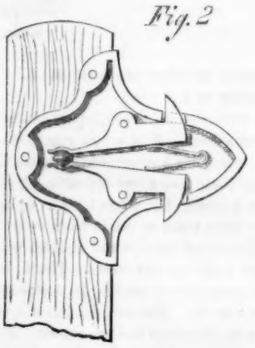
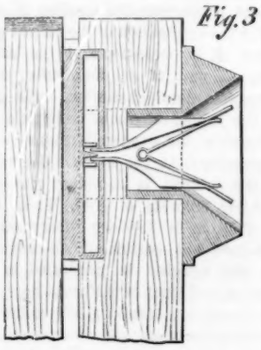


*Fig. 3*



**WOODCOCK'S GATE FASTENER.**

Fig. 1 shows a perspective view of the arrangement wherein the box on the gate post, which receives the catch on the gate, is shown by A. This detail is a hollow casting with recesses inside, so placed that the projecting spurs, B, worked by the levers, C, in the box which goes on the gate, D, fit in them, and hold the gate without a possibility of its getting away or sagging down. The section in Fig. 2 shows the shape of the piece on the gate that fits in the box on the post, as also the springs which throw the spurs, B, out. Fig. 3 is a section of the box on the gate through the levers, C, showing the attachment of them to the spurs.

This device is applicable to some window sashes to prevent them from being raised from the outside, and is a sure thing for the purpose.

A patent is now pending on it through the Scientific American Patent Agency. For further information address the inventor, John P. Woodcock, No. 224 East Fifty-third street, New York.

### A Chance for Inventors.

The *Country Gentleman*, an esteemed agricultural journal, says there is great need of improvement in trucks for carrying beef cattle to market. We quote:—

"The last time we took the railroad—a day intensely warm, even with every mode of ventilation fully open—we chanced to pass a cattle train at a way station, crowded as full as they always are, with but very narrow gratings on the doors for the admission of air, with the fearful odor which accompanies such a train on a long journey, and the poor things inside pent up and panting for breath. Really something ought to be done to render the transportation of stock in hot weather, less a source of misery to them; not out of mercy alone to the animal whose scanty supply of fetid air must become so intensely sickening, but for the sake of those who are to consume the feverish and unwholesome meat thus tainted more or less completely in every pore. The subject is attracting much attention in Great Britain, where the diseased character so imparted to the flesh has been fully proven. The Scottish Farmer gives an engraving of a railroad cattle truck, which is certainly a great improvement. It is open for the admission of air along both sides, just above the head of the cattle, and at a proper height to be within their reach a trough about 10 inches wide and 10 or 12 in depth, extends around the outside of the whole car, to be filled with water for their use at intervals on the journey. This plan has been patented, and the Highland Society has awarded a medal for it to the patentee."

Great loss is also incurred by drivers, in cattle badly treated, so that we may reasonably expect their co-operation in any improvement.

### An Automatic Well Borer.

Gen. H. Hanpt has invented a machine called the "Automatic Well Borer," which consists of a vertical cylinder placed directly over the well and operated by steam, with a hollow piston rod attached to a solid piston, which moves a rope of hemp or wire to which the boring tool is attached. Connected with this by a very simple method is the means of producing a continuous rotation of the drum upon which the rope is wound. At the same time a self-adjusting automatic feed is produced, regulating the force of the blow. The drum can also be rotated so as to withdraw the tools and return them with great rapidity. A sand pump also possessing an apparatus for its rotation is attached, by which examination of the various strata reached may be made and records kept. The boiler to furnish the necessary steam is provided, and one of the principal points of the machine is in the peculiar form of drill used, which penetrates rapidly, bores a truly circular hole without a reamer, and can be sharpened readily at any time with a hammer.

Principal among the advantages claimed for this machine there is economy in fuel, the direct action of the steam in raising the piston, which, falling by gravity, requires use of steam in one direction only. A greater number of blows in a given time is also obtained, and by the rotation of the tools in the same direction, a round hole is made, and the wedging of tools prevented. The ability to withdraw and return the tools rapidly renders it possible to bore at a depth of 1,000 feet at the same cost per foot as at a depth of 100.

The objections and delays attendant upon the use of rods, poles or pipes are entirely overcome, and a vast saving in time and money thus made. The expense of the whole apparatus is very moderate, requiring no engine, and costing much less than the pipe drill which requires the use of an engine.

A Historic Cow.—Gen. Morgan recently presented to the Soldiers' Home at Washington, a cow that belonged to Gen. Sherman's mess. She left Atlanta Nov. 16, 1864, marched with the army via Savannah, all the way to Washington, traveling a distance of 1,220 miles.

THE

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VOL. XIII. NO. 1...[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, JULY 1, 1865.

## OUR PATENT SYSTEM.

Octavus I. Norris, who signs himself attorney at law, residing at Lancaster, Pa., publishes a letter in the *American Railroad Journal*, wherein he assails the present patent system. With a view to show the groundwork upon which his objections are laid, we extract a few of the leading points embraced in his letter. He begins his essay thus:—"Under the present system of the Patent Office, patents are issued without limit, the patentee is guaranteed the entire monopoly; and being usually an uneducated and poor man, and elated with a prospective fortune or reward, relying with faith upon the wording of his letters patent, he devotes his entire attention and expends his last dollar for the purpose of putting his improvement before the public."

He further says:—"In fact, the Patent Office encourages the genius of our countrymen, promises protection in securing a monopoly, but through a desire to please the applicant, by issuing patents too freely, has brought the public to disregard and treat with contempt its opinions as to the validity of a patent it issues. Patentees decry the way in which they are encouraged by the Patent Office, to exhibit their improvements with an idea that they are to be protected, and are so robbed; while on the other hand the public denounce the patentee as a blackleg, of levying black mail, etc."

He then adds that "No nation has made greater advancement than the United States in the arts, and this is of course from our native talent, which, for what it has [done] and will yet do, demands a better protection and security in reaping a reward for its labor, which in no country has been more denied than with us."

He also says that "a change is demanded by the general public, as patentees, and the public welfare; and with a united action of those who appreciate the necessity of a revision of our Patent laws and the mode of issuing them, this can be effected to the general benefit of all classes, and especially railroad companies, who have, by our present system, both done and received injury."

Mr. Norris suggests nothing by way of amendment, but contents himself with vague generalities, inviting, however, co-operation with a view to operate on the next Congress for a reform. We suggest that if he would better acquaint himself with the existing patent system, which he attempts to cover with reproach, he would not be likely a second time to appear in print so much to his disadvantage.

In the first place, patents are not issued without limit. The intention of our law is to prevent the very thing of which he complains. The Constitution of our country provides for the protection of inventors and authors for a limited period. In pursuance thereof, Congress has enacted laws prescribing how inventors and authors shall be protected. In the case of inventors, a Commissioner, assisted by a competent board of examiners, are provided, whose duty it is to inquire into all claims that may be presented, and they are in duty bound to reject every claim that is clearly anticipated by another applicant or patentee. This is the constant and daily practice of the Patent Office, and that duty is well performed, as the records of the office fully attest. A few figures, we think, will not only vindicate the Patent Office from the charge that patents are granted "through a desire to please the applicant," but will also knock the writer's "without limit" theory in the head.

For the year ending September, 1863, there were filed 5,133 applications for Letters Patent; of this number 1,246 were, after preliminary examination, rejected. For the year ending September 30, 1864, there were filed 6,740 applications, of which number 1,907 were rejected. This system of previous examination, followed by a corresponding ratio of rejections, has been in vogue for nearly thirty years. The system has not only worked well, but has given very general satisfaction, and yet Mr. Norris has the boldness to declare that patents are issued "without limit." He further declares that "the patentee is guaranteed the entire monopoly." We deny this statement. Neither the Patent Office nor the laws guarantee an entire monopoly. In the first place, the best writers generally agree, that the term "monopoly" does not properly apply to patents. Carpmael, in his excellent treatise on "the Law of Patents," says —"It is evident that a grant of a patent for an invention is the very opposite of a monopoly; for a patent to be valid must be for a new invention, consequently no persons, by such grant, are restrained from any freedom they had before." This point, however, we need not now discuss. The Patent Office, having patiently and carefully examined the applicant's claims, issues its authorized Letters Patent, if the specific device claimed appears to be novel. The Letters Patent so issued are not a legal guarantee of entire monopoly. The law, it is true, provides protection against infringers, but it devolves upon the patentee to defend its own rights and privileges. If his invention should prove, upon legal investigation, not to have been new at the time the patent was granted, the patentee has no guaranteed monopoly, and cannot restrain the public from a free use of the invention.

We do not undertake to say that all patents are properly granted, but we do not hesitate to say, as the result of our own experience, that more errors are committed in refusing than in the granting of patents. The examiners are liable, like other men, to commit errors, and we think it would puzzle the writer under review, to find out perfection anywhere in the management of human affairs.

The writer admits that no nation has made greater progress in the arts than in the United States. This progress, which is manifested throughout the whole range of our mechanical industry, is due chiefly to the liberal spirit of our patent system and to the liberal policy which has prevailed in our courts of justice, as applied to patents, and yet the writer declares that the protection to our native talent, has been denied more than in any other country. This statement is positively absurd. No other country on earth has extended so much protection to inventors as our own. In Great Britain patents are granted to the inventor and also to the *introducer* of an invention. In France no oath of invention being required, patents can be obtained by any one who applies for them, though it is but just to say that the French law reserves the prior right to the first discoverer. In Belgium the law is of similar import.

Without entering into a discussion of the glaring defects of the European patent system, it seems to us that Mr. Norris, who proclaims himself as having had much experience in patent-law matters, must have some special end to serve when he seeks to rally, with others, railroad companies—who have never manifested a willingness to pay patentees—to undertake to break up our present system of granting patents. The arguments he employs are not creditable to his legal knowledge of the subject whereof he undertakes to write.

## THE "JOURNAL OF COMMERCE" ON FLYING.

In the discussion of Payne's light, water gas, carbonic engines, the monitors, and in several other controversies, the SCIENTIFIC AMERICAN has stood alone against nearly all the daily press of the city, and in every case the result has confirmed the correctness of our position. These repeated defeats seem so to have disturbed a portion of our contemporaries that they are puzzled how to deal with us. Sometimes, however, they appropriate our ideas, and then the ingenuity they exert to avoid giving us credit, and the blunders into which it leads them, are amusing. In the *Journal of Commerce*, of June 19th, the leading editorial is headed, "Men as Birds," and it contains this paragraph:—

"While these revolutionary experiments in locomotion are going on here, the British aeronauts are not idle. At a recent meeting of the British Polytechnic Association, a Mr. Barbour stated that by using compressed carbonic acid gas, he had obtained one and a half horse power from an iron engine which weighed with all its auxiliary apparatus only 450 lbs. An engine of aluminum would weigh only one-third as much. The gas reservoir was strong enough to bear 5,000 lbs. to the inch, and the gas that could be forced into it would suffice to drive the engine an hour and twenty minutes. Mr. Barbour proposes to use such an engine in propelling an air ship by revolving spiral fans, upon the plan of the one building at Hoboken, and at once gets rid of all the difficulties resulting from a heavy steam engine or hot air engine, furnaces, etc. His scheme was looked upon not unfavorably by some of the English scientific journals."

Our readers do not need to be told that these facts, estimates and suggestions are taken from a recent editorial in the SCIENTIFIC AMERICAN; but we will inform the *Journal of Commerce* that the Polytechnic Association before which Mr. Barbour described his engine was the Polytechnic Association of the American Institute of this city, and whether the scheme was looked upon favorably or otherwise by some of the English scientific journals could not possibly have been known here on the 19th of June, as there had not then been time for a reply to be received since the number of our paper containing the first account of the matter crossed the Atlantic.

## THE WAY WOODEN TOOTHPICKS ARE MADE.

Perhaps in all the arts there is no other machine that multiplies the product of labor to a greater extent than the simple little machine recently invented by J. C. Brown, of Brooklyn, Long Island, for making wooden toothpicks and splints for lighting lamps, for matches, for baskets, and for some forty other purposes. A block of wood is placed in the machine and the splints pour out in a constant stream, or cataract, like the pouring of corn from a half bushel.

This machine is as simple as it is effectual, it being nothing more than an ordinary lathe for turning wood, with a little addition. The trunk of a whitewood tree is sawed into blocks of a length equal to the length of the toothpicks or splints, and is centered in the lathe. The turning tool is a long, stiff chisel, extending the whole length of the block or more, set vertically with its edge on a level with the centers, and fitted to slide back and forth horizontally, and to be fed forward by a worm, which is turned by the machine. Upon the opposite side of the block is a roller of the same length as the block, with a series of blades secured to its surface, the spaces between the blades being equal to the width of the splints. For lamplighters the blades are set parallel to each other, but for toothpicks they are set at a small angle so as to cut the picks of the proper taper, the narrow ends alternating with the broad, and thus using up all the wood.

The block is first turned off smooth by the straight blade, and then the cutter with the radial blades is brought forward against the opposite side, and thrown into gear, when it feeds forward as the wood is cut away. The radial blades cut shallow gashes into the block to a depth just equal to the thickness of the splints, and then as the block revolves the splints are shaved off by the straight chisel. One machine will make 20,000 splints a minute.

## REDUCTION IN TERMS.

With a view to encourage the formation of "Clubs" for the ensuing volume of the SCIENTIFIC AMERICAN, we offer to take subscriptions in *Clubs of ten or more at* $2 50 *per annum*. We trust that our friends will set themselves to work to get up Clubs at the rate here proposed.

### ICE CREAM.

A correspondent asks how to make ice cream. We will tell him. A pint and a half of milk and half a pint of cream, scalded together; three eggs whipped to a stiff froth, and stirred in rapidly, and sweetened to taste; flavor this mixture with any thing preferred—peach water, bitter almond (which is nearly the same), vanilla, or lemon. Pour it in a freezer, and keep the same going continually until wanted.

A frozen custard can be made by adding cornstarch, but this is not genuine ice cream, and tastes "floury," compared with the real article.

The great secret in making fine cream is to freeze it properly and quickly. Crystallization, or the act of freezing, is a great separator, and when two substances, such as cream and milk, are mixed, slow congelation separates the watery portions from the other parts, and causes the little pieces of ice, common in poorly-made ice cream. Quickly-frozen cream has a smooth continuity, if we may use such a term, greatly admired. It is easy to make a dish of cream for ordinary use by taking a three-quart pail and setting it in a small wash tub, surrounded with ice and salt, but the article so made will be very different from the buttery and even mass frozen in the proper apparatus.

### REVISING THE REVENUE LAWS.

A commission of three gentlemen, authorized by a law of Congress enacted last winter, is in session in the Custom House in this city, to inquire into the sources of national revenue and the best method of collecting the same. The appointments were made by the Secretary of the Treasury and consist of Messrs. David A. Wells, of Troy, Stephen Caldwell, of Philadelphia, and S. S. Hays, of Chicago. E. B. Elliott, of Boston, has received the appointment of secretary to the commission.

The various sources from whence the Government derives its internal revenue will be carefully examined into by the commission, with a view to recommend such changes to the next Congress as will tend to establish a more satisfactory and equitable system of national taxation.

With such men in the commission as Mr. Wells, long known as editor of the "Annual of Scientific Discovery," author of "Our Burden and our Strength," and many other useful works, we are sure much good will result from the investigation they will make. The commission is impowered to send for persons and papers and take testimony.

### AN ENCOURAGING PROSPECT.

The American Institute has decided to hold its annual fair this fall, as usual, and means to make it very different from the exhibitions in former years. We are assured by the committee that no pains will be spared to make this fair a great success. "It is to be a mechanical fair," said a member to us, "and all the old ladies' bedquilts are to be excluded." We trust also that the wonderful compounds "which stimulate a growth of hair on the baldest head," will also be omitted and the space usually occupied by them filled with something more interesting to the public, and more valuable to the arts. There are to be machines of all kinds in full operation and ample space will be allotted to exhibit them to the best advantage. The fair will be open from September 15th to October 19th, or about four weeks, and will be held at the corner of 14th street and 6th Avenue. There is ample material in this country to make this fair a great success, and with the inducements held out by the Institute, we have no doubt that it will be. All communications in regard to space should be sent to S. D. Tillman, Esq., agent of the American Institute. We have no further information to give of any nature whatever.

### CITY DIRECTORY.

Trow's New York City Directory, for the year ending May 1st, 1866, is issued. It is a work of 1300 pages; 1070 being devoted to an alphabetical list of the names of the business men and heads of families of New York, 170 to advertisements, and 60 to lists of the streets, churches, banks, societies, city officers, and other things convenient for reference. This is the 79th volume, and contains 166,144 names, 13,592 more than the volume for last year. It is printed in clear type, on smooth paper and is just what a directory of this city ought to be.

### Facts About Eggs.

Eggs differ a good deal in weight. This difference is to be found not only in the eggs of different breeds or races of fowls, where it might be expected, but often, also, in the eggs of the same individuals, both among hens and the smaller and wild birds.

Barley is said to increase the proportion of the yellow of the egg, and rye is said to favor the development of the white.

Eggs lose a slight portion of their weight when left to themselves; the contents becoming dried up gradually and reduced, so that there is left a solid residuum withdraw towards the small end of the egg, the opposite end being filled with air. Eggs which weighed two and a half ounces when fresh, weighed but a very small fraction over an ounce at the end of two years. During incubation the diminution or weight is pretty rapid.

It is thought by naturahsts that the eggs of domestic hens of the present day are, on an average, very nearly a third larger and heavier than those of the hens of the ancients.

The proportions of the yolk to the white of the egg are very nearly the same in each of the different races, but in proportion as the egg diminishes in size, does the relative proportion of the white to the yellow of the egg diminish; that is, small eggs have more yellow than large ones in proportion to their size, but the weight of their shell is also greater in proportion.

Eggs which contain the largest yolk or yellow, like those of the Brahma and Cochin China hens, produce the largest chickens.

The period of laying is ordinarily about five months in the year. The Asiatic fowls will often begin to lay somewhat earlier than other breeds, but they usually stop earlier.

The latest expression we have from the poultry breeders of France in regard to the comparative merits of the Asiatic breeds and their own, is that the former as layers, as sitters, as nurses and as table birds, are inferior to the the native French fowl; that it would be a mistake to substitute the one for the other; that the crosses take from the French races more advantages than they confer upon them, and that it is most useful for them to return to the indigenous races, and spend their care and their experiments in improving them by better keeping, by better selections, and by crossing them among themselves.—*Massachuetts Plowman.*

CABBAGES.—One of the greatest difficulties encountered in raising cabbages, is the ravages of the cut-worm. We have completely outwitted them for two or three years past, in a very simple manner. We take pieces of newspaper six inches square, tear a slit in one side to the center and insert the plant. Bring the slit edges together, and place a little earth or a pebble on the corners, and the work is done. A platform of paper is formed around the plant through which the worm cannot penetrate. We did not lose more than two or three plants from that cause the last two years. We always think it a great point gained when an effectual safeguard can be obtained against the ravages of insects, and we regard this as one of the discoveries of the age.—*Maine Farmer.*

A RAILWAY TRAIN STRUCK BY LIGHTNING.—The express train from Berlin, that arrived at 7 P. M. on the 23d of May at Dortmund, was struck by lightning in the neighborhood of Gutersloh. The metallic signal line fixed on the top of the carriages, and extending the whole length of the train, served as conductor of the electric fluid, which injured one of the stokers so severely that his limbs were paralyzed, and some fears were at first entertained for his life.—*London Engineer.*

THE DESTRUCTION OF THE BEET ROOT.—The *Pas de-Calais* Society of Agriculture offer a prize of 100f for the best paper on the worms and insects that attack the beet root, and the means of preserving the latter from their depredations.

THE work of stretching the wires for the telegraph by Behring's Straits has been commenced.

ISSUED FROM THE UNITED STATES PATENT-OFFICE FOR THE WEEK ENDING JUNE 20, 1865.

*Reported Officially for the Scientific American.*

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

48,249.—Constructing Gun Barrels.—Ethan Allen Worcester, Mass.:

I claim splitting a twisted rod through the center, and bringing what was the inside of the rod on the outside of the barrel, substantially as specified and for the purpose set forth.

48,250.—Car Spring.—T. F. Allyn, Canandaigua, N. Y. Antedated March 28, 1865:

I claim the construction of a metallic car spring with square or rectangular plates, B, curved diagonally, and fastened together alternately at the corners with the rivets, d, substantially as described in my specification, and for the purpose set forth.

48,251.—Artificial Leg.—John J. Austin, New York City:

I claim, First, Sinking the edge of the thigh socket to fit to the os-innominatum, substantially as and for the purpose set forth.

Second, The double stops of the knee joint produced by the stud, c, the edges, e f, of the slot, e', and the end, g h, of the thigh, B, and leg, C, substantially as and for the purpose described.

Third, The combination of the elastic segment, k, and spring, i, with the stud, c, and with the knee joint, substantially as and for the purpose specified.

Fourth, The two stops, n o, and abutment, p, in combination with the spring, g, in the ankle joint, constructed and operating substantially as and for the purpose set forth.

48,252.—Coal Stove.—Robert Bailey, Cleveland, Ohio:

I claim, First, So constructing the fire box that the fuel is consumed just in the rear of the same, when said chamber is arranged in relation to the ash-pit, F', air chamber, F, and damper, L' and H' substantially as set forth.

Second, I claim arranging the fire box, E, in front of the stove, in combination with the hot air chamber, F, the draft pipe, J, and diving flue, a, as and for the purpose set forth.

48,253.—Stove Pipe Water Heater.—John Baumeister, Detroit, Mich.:

I claim a stove pipe water heater above set forth, constructed substantially as and for the purpose above described.

[This invention consists in a novel construction and arrangement of part of a stove pipe, whereby it is formed into a heating drum, whose shape is such as enables it to embrace a movable water vessel, wherein water can be heated by means of the heat of the products of combustion and hot air which pass through the stove pipe.

48,254.—Regulator for the Wicks of Lanterns.—Henry W. Bleyer, Buffalo, N. Y.:

I claim the rod, E, provided with an oblong slot, e, and fitted on a pin, a, or arranged in any suitable way so as to have a requisite degree of longitudinal play or adjustment, in combination with the toothed wheel, D, on shaft, C, all arranged substantially as and for the purpose specified.

[This invention relates to a new and improved means for regulating the wicks of lamps for lanterns, whereby the wicks may be raised and lowered without removing the lamp from the lantern and with the greatest facility.]

48,255.—Means for Manufacturing Baskets.—Ernst Bredt, New York City:

I claim a basket formed by pressure between heated dies, of a sheet of material suitably prepared with sizing, stiffening or moisture, substantially as specified.

48,256.—Apparatus for Testing Milk.—Chas. S. Brown, New York City:

I claim, in combination with the test tubes, a permanent or movable scale to measure and compare the depth of cream or other matter in each tube with that in the other tubes, substantially as described.

48,257.—Calipers.—Clarence E. Brown, Florence, Mass.:

First, I claim attaching a movable scale to a calipers, substantially as and for the purpose above described.

Second, I also claim constructing a registering calipers, so as to be self-adjusting, by means of its index and a pin upon the movable scale, substantially as above described.

[This invention consists in making a self-adjusting, self-registering calipers. Its points project toward each other from the ends of its legs, and the line of their projection is in the arc of a circle drawn from the center of the calipers, so that the wear of the points does not shorten the radius. A scale for indicating the measurement is attached to the body of the instrument, and it is made movable therein, so as to enable one to adjust it to a new position as the points of the legs wear away.]

48,258.—Device for Boring and Excavating Coal.—Andrew Buchanan, Brooklyn, N. Y. Antedated June 15, 1865:

I claim, First, The longitudinally-adjustable revolving cutter bar, D, in combination with the self-feeding truck, A, constructed and operating substantially as set forth.

Second, The use of sectional cutters, E, in combination with the revolving cutter bar, D, and truck, A, constructed and operating substantially as and for the purpose described.

[This invention consists in the employment or use of a revolving longitudinally-adjustable cutter, in combination with a truck, to which feed motion is imparted by the same power which is applied to impart motion to the cutter bar, in such a manner that by the action of the cutters inserted in said cutter bar a narrow ditch of any desired length and of suitable depth can be cut in an embankment of coal, limestone, or other similar material in a horizontal or inclined direction, and the labor of excavating coal or other material is considerably reduced. The cutters are arranged in sections, which are secured to the bar in equal lines, so that the material to be excavated has a chance to clear itself, and the action of the cutters will not produce an injurious strain on the cutter bar or other parts of the apparatus.]

48,259.—Lathe Chuck.—S. B. Burritt, New York City:

I claim the combination of the radially movable clamps, H H,

having dovetail tongues of double reversed inclination on their outer edges, the rings, F and G, having right and left hand male screws upon their ex eriors, and inclined grooves in their interiors, and the loose sleeve, B, having right and left hand female screw threads in its interior, the whole arranged and applied in relation to each other and to the hub, A, or body of the chuck, and operating substantially as herein specified.

**48,260.—Torpedo Ram.—Elijah R. Chamberlain, Sharonville, Ohio. Antedated June 10, 1865:**

First, I claim the frame, B B1 B2 b, constructed substantially as described, adapted to permit torpedoes to be expelled from the interior of the vessel below the water line, or to hold them at its mouth, and receive and effectually withstand the force which is applied to the torpedo on being driven into an enemy's vessel.

Second, in combination with the above, I claim the piston, G G', operated by the chains, F F', or other suitable means, and employed to expel the torpedoes through the opening, B3, or, in connection with the block, H, to retain the torpedo in its operating position when the same is to be driven into an opposing body.

Third, I claim the ropes, C, and the hooks, C, in combination with the pulleys, C2, and their shifting levers, E E, the whole being arranged to operate substantially in the manner and for the purpose specified.

Fourth, In combination with the aforesaid, B B' B'', I claim the gate, I, operating as herein described to close the opening, B'', when said opening is not occupied by a torpedo or the expelling piston.

**48,261.—Baling Press.—Frederick F. Cornell, Jr., New York City:**

I claim, First, Connecting the levers, D, to the sliding slides, E, and follower, B, by means of the staples or eyes, b b, and fulcrum pin, d, and rods, e e, or their equivalents, substantially as herein described.

Second, The pawls, H, arranged so as to hold the beater in place, to serve as a head block for the press

Third, The racks I, and slides, F, in combination with the pawls, H, as and for the purpose specified.

Fourth, The standards, F F, and cross beam, G, in combination with the rod, b, and pawls, H, arranged to operate substantially as described.

Fifth, The detent rod, f, in combination with the projection, f, and standards, F F, substantially as and for the purpose hereinbefore described.

Sixth, The cam, J, in combination with the traveling side, E, and post, A, substantially as and for the purpose herein specified.

**48,262.—Wheat Drill.—Jacob B. Crowell, Greencastle, Pa.:**

First, I claim the use of the above-described eccentric pin for supporting the wheel, E, and throwing the same out of gear and into gear, substantially as set forth.

Second, The above-described arrangement of the three gear wheels, C E and K, with the stationary hopper, substantially as described.

Third, The combination of the gear wheel, E, with the eccentric pin and arm, O, when operated simultaneously with the elevation or depression of the boots, as described.

Fourth, I claim a feed slide, when cast or made in two pieces or sections locked or coupled together and operated as one slide, substantially as described.

**48,263.—Washing Machine.—Erastus Douglass, Lowell, Mass.:**

I claim the combination of the cross piece or block, E, the tube, A, and the beater, C, as and for the purpose herein specified.

**48,264.—Shutter Hinge.—Simon Dunn, Allegheny City, Pa.:**

I claim making on each end of the knuckle of the female part of the hinge two or more planes, corresponding to two or more around the pintle of the male part of the hinge, substantially as herein described and for the purpose set forth.

**48,265.—Apparatus for Distilling Petroleum.—A. Dubreuil, Baltimore, Md.:**

I claim the use of boiling water inside the retort or still to vaporize the material known as petroleum or rock oil, substantially in the manner and for the purposes herein before shown and described

**48,266.—Boot Heel.—Edward Dunbar, Buffalo, N. Y.:**

I claim a metallic holding plate, A, having an inner dovetail groove for receiving and holding the elastic tread piece, B, so that the tread piece will be firmly held in the groove by its expansive force without other fastening, for the purposes and substantially as described.

**46,267.—Umbrella.—John S. Fee, Felicity, Ohio:**

I claim an umbrella whose web or covering is composed of a single piece of india-rubber, substantially as set forth.

**48,268.—Process for Preparing Coffee.—L. D. Gale, Washington, D. C. Antedated June 12, 1865:**

I claim separating the aroma or volatile oil of coffee from the watery vapor, substantially in the manner and for the purpose herein set forth.

I also claim the recombination of the aroma with the soluble nonvolatile parts of the coffee, preparatory to making the same into a solid cake, substantially in the manner and for the purpose set forth.

I also claim a dense and solid cake coffee, that can be handled by itself like cakes of chocolate or sticks of candy without the aid and expense of boxes or cans, which are indispensable in all that class of preparations called coffee paste and coffee extract.

**48,269.—Seeding Machine and Cultivator.—Thomas A. Galt, Sterling, Ill.:**

I claim the method of operating the slide, D, through the medium of the rack, i, toothed segment, j, and gearing, n o, in combination with the sliding plate, F, which is moved upon the slide, D, by means of the rack, f, and toothed segment, g, the whole arranged as described and represented.

**48,270.—Head Rest for Railroad Car Seat.—Nelson Gates, Middletown, Ohio:**

I claim, First, The spring head rest, constructed, arranged and applied to use in the manner and for the purpose substantially as described.

I also claim the spring head rest, constructed as described, in combination with the fastening by which it may be attached to the car, substantially as and for the purpose set forth.

**48,271.—Cultivator.—Edward S. Gillies, Albany, Wis.:**

I claim the attaching of harrows and plows, either or both, to the frame of a cultivator, by means of pendant rods, E, provided with springs, F, and connecting the heads of the harrows and plows to springs, I, attached to shafts, J, at the front part of frame, A, in the manner substantially as and for the purpose set forth.

[This invention relates to a new and improved cultivator for general use, and it consists in a novel arrangement of various plows and guards, whereby the implement may be adapted to various kinds of work.]

**48,272.—Chair.—John Habermehl, Wheeling, W. Va.:**

I claim the arrangement of the seat of a chair, sofa, etc., herein described, the same consisting in hanging it by standards on its upper side to and upon its rear legs, in combination with so inserting the front legs within the seat that the seat can freely play up and down on the same, and yet not be disengaged therefrom, substantially as and for the purposes specified.

[This invention relates to the manner of connecting the seat of a chair to its legs, whereby it may be readily tipped or inclined in a backward direction, to suit the wishes of the person occupying it.]

**48,273.—Beer Faucet.—Albert Hallowell, Lowell, Mass.:**

I claim, First, The faucet connection, B, as made with the two screws, N and P, or their equivalents, provided with the valve and its seat, arranged substantially as specified.

Second, I also claim the said faucet connection, B, as made with the head, o, combined with the screws, n and p, and the valve and its seat, arranged as described.

Third, I also claim the said connection as made with the perforated guard or strainer, r, the valve and seat and the screws, arranged as specified.

Fourth, I also claim the faucet, constructed with the screw, a, and the projection, c, as arranged, with the connection, B, provided with a valve a ranged within it as specified

Fifth, I also claim the combinat on of the connection, B, provided with a valve, and made with screws, n and p, as described, with the faucet constructed with the screw, a, and the projection, c, the whole being substantially as and for the purpose specified.

**48,274.—Ticket Box.—E. Hambuler, New York City:**

The use of a box provided with suitable cutters, and with or without a bell, in combination with tickets, formed substantially in the manner herein described, or in any other equivalent manner, so that by the act of withdrawing the ticket from the box, a portion of said ticket is retained, and serves as a check for the ticket, as herein set forth.

**48,275.—Snap Hook.—Edward Hamilton, Chicago, Ill.:**

I claim, First, The cylinder, D, when attached to the eye or swivel of a snap hook, and fitted to receive a shank collar or slide and spring.

Second, The shoulder or stop, b, in combination with the collar, E.

Third, The collar, E, when applied to a snap hook, and has its inner end rest on a spring and its outer end arrested by a stop.

Fourth, The combination of the collar, E, spring, a, and stop, b, with the hook, A.

Fifth, The combination of the cylinder, D, collar, E, spring, a, and stop, b, with the hook, A, arm, B, and eye, C.

Sixth, The combination and arrangement of the collar, E, spring, a, and the incline of the end of the arm, B, whereby I am enabled to close the hook by simple pressure on the arm, B. Each of said parts and combinations being constructed and arranged substantia ly as and for the purposes set forth and specified.

**48,276.—Mercurial Heater.—Thos. C. Hargrave and Kendal W. King, Boston, Mass.:**

We claim, First, The continuous or endless pipe, B, constructed and filled, or partially filled, with mercury, substantially as described and to the effect stated.

Second, The combination with the pipe, B, containing mercury of the lamp, D, or other heating appliance, substantially as and to the effect set forth.

**48,277.—Churn.—Geo. Hart, Atwater, Ohio:**

I claim the guide, H, straps, m m', and lever, L, in combination with the pulley, F', and beaters, P, when arranged and operating as and for the purpose set forth.

**48,278.—Churn.—Edward F. Holloway, Knightstown, Ind.:**

I claim the disks, B and C, when constructed and arranged as shown, at the bottom of vessel, A, and operating substantially in the manner described.

**48,279.—Band Cutter for Thrashing Machine.—W. Upton Hoover, Macomb, Ill.:**

I claim, First, The combination of the rotary cutter, B, and spout, C, constructed and operating as and for the purpose set forth.

Second, The reversible platform, E, and hinge board, D, in combination with spout, C, arranged to operate as and for the purpose herein described.

Third, I also claim the combination and arrangement of shaft, b, provided with pulleys, f, and wheels, c, with the transverse shafts, provided with the wheels, d, and pulleys, h, for the purpose of driving the cutter, B, as set forth.

**48,280.—Band-cutting Machine.—W. Upton Hoover, Macomb, Ill.:**

I claim, First, The reciprocating band cutter, a, arranged and operating substantially as set forth.

Second, In combination with the cutter, a, I claim the feed rollers, C and C', constructed and operating substantially as shown and described.

Third, I claim the vibrating shaker, E, when used as shown, for the purpose of feeding the grain into the thrasher.

Fourth, I claim the combination and arrangement of shaft, F, provided with the crank, h, gear wheels, i i, cam, p, or its equivalent, and wheels, m and m', as and for the purpose set forth.

Fifth, I claim the adjustable bearings, d and d, provided with the racks, g and g', in combination with the wheels, f for the purpose of adjusting the rollers, C and C', as herein described.

**48,281.—Cultivator.—B. Holtz and Wm. Enoch, Springfield, Ohio:**

We claim, First, Connecting the drag bars, E E, to a single point on the main frame by the draught rods, G G, substantially as described.

Second, In combination with the draught rods, G G, the traveler rod, a, substantially as described.

Third, We claim imparting a lateral motion to the rear end of the plow beams by means of the two single levers or rods, O and K, arranged and operating as described.

Fourth, We claim pivoting the lever, K, upon the self-adjusting pivot, L, in the manner shown, for the purpose of permitting said lever to be moved both vertically and laterally, and thus perform the operation of moving the plows without the use of more than one lever, K, and with but a single pivot for said lever.

Fifth, Connecting the drag bars in front by the stretcher, F, provided with pivot screws and set screws, as described.

Sixth, The combination and arrangement of rods, G, drag bars, E, posts, H, foot rests, J, levers, K and O, ring, k, and joint, L M, as shown and described.

**48,282.—Windlass.—Peter H. Jackson, New York City:**

I claim, First, The bolt, i, actuated by the cam or eccentric, 3, for connecting or disconnecting the chain wheel, h, from the wheel, f, as specified.

Second, I claim the strap, k, blocks, t and d, in combination with the cam, n, substantially as specified.

Third, I claim the wheel, f, provided with handspike sockets, 2, in combination with the chain wheel, h, and the bolt, i, or its equivalent, for connecting or disconnecting the wheels, f and h, as set forth.

Fourth, I claim the levers, q, and pawls, r, fitted as specified, in combination with the ratchet wheel, f, and chain wheel, h, as set forth.

**48,283.—Wire-pointing Machine.—C. Jillson, Worcester, Mass.:**

I claim, First, The combination of the cutter stand, H I, with the hinged platform, G, and table, A, substantially as and for the purposes specified.

Second, The elastic band or spring, u, in combination with the sliding block, Q and supporting eye, t, substantially as and for the purposes specified.

Third, The combination of the hinged platform, G, cutter stand, H I, and side pattern, E, substantially as and for the purposes specified.

**48,284.—Mode of Roasting, Desulphurizing and Disintegrating Ores of Gold, Silver, Etc.—Algermon K. Johnston, New York City:**

I claim the treatment of sulphurets, asenurets and phosphides of iron, copper, nickel or lead containing any of the precious metals, with and by steam with or without the presence of atmospheric air, for the purposes of freezing such ores from sulphur, arsenic and phosphorus, and preparing the precious metal for amalgamation or other subsequent treatment.

**48,285.—Apparatus for Distilling Oil.—James J. Johnston, Allegheny City, Pa.:**

I claim, First, Distilling oil or other liquids by means of a still, condenser and receiving vessel, from which air is exhausted, so that the distilling process is carried on under a partial vacuum, substantially as herein described and set forth.

Second, The arrangement of the vessel, a, furnace, b, condenser, k, vessel, l, and receiving vessel, m, furnished with tube, x, scale, g, valves, 7 and 8, and rack, n, the whole being constructed, arranged and operating substantially in the manner herein described and for the purpose set forth

**48,286.—Steam Furnace Grate.—Edward H. Jones, West Albany, N. Y.:**

I claim, First, A series of grates, when cast in the form herein described, and operated in sets of two or more.

Second, In combination with the action of the grate independently by means of the levers, C C, and the arms, F F, the use of the oxygen distributer, D D, substantially as shown, for the purpose of producing more perfect combustion.

**48,287.—Revolving Fire-arm.—B. F. Joslyn, Stonington, Conn.. Antedated June 14, 1865:**

I claim the frame, with its two projections, a and a', and their dovetailed recesses, in combination with the enlargement, b, of the barrel, and its dovetailed projections, x and x', the several parts being arranged and adapted to each other, as set forth.

**48,288.—Breech-loading Fire-arm.—B. F. Joslyn, Stonington, Conn.:**

I claim, First, The lever, G, and the spring pin, n, or its equivalent, in combination with the breech-piece, D, and its recess, q, the whole being arranged and operating substantially as herein set forth.

Second, The supplementary hammer, E, combined and arranged to move with the breech-piece, D, and to operate on the cartridge, substantially as described.

**48,289.—Wood Base-burning Stone.—John W. Lane, Newton, N. J.:**

I claim, First, The employment of the fire-box or chamber, C, containing the open and vertical grate, F, in the rear and lower part of the partition wall or plate, L, and also containing the opening or space, O, in the front, and at or near the lower end of the wall or plate, W, in the manner and for the purposes substantially as herein described and set forth.

Second, I also claim the combination of the vertical grate, F, with the openings or space, O, at the bottom of the vertical partition, plate, W, in the manner substantially as and for the purposes herein set forth.

Third, I also claim the damper, a, in combination with the intermediate flue or space, H, and fire chamber, C, in the manner and for the purposes substantially as herein described and set forth.

**48,290.—Intagliotype Plate.—Edwin B. Larchar, New York City. Antedated April 5, 1865:**

I claim, First, The metallic plate with the hardened coating of oxide upon it, made substantially in the manner described, as a new article of manufacture.

Second, The use of the oleaginous ink or pigment, in drawing a design on the surface of the oxide, so as to protect the parts drawn upon from being coated by the coating solution afterward applied.

**48,291.—Self-regulating Damper.—Chas. H. Lavis, Philadelphia, Pa. Antedated March 15, 1865:**

I claim the drum, A, the damper, B, the rod, C, the screw, D, and the balance, E, constructed and operated with reference to each other, and for the purpose and in the manner as herein shown and described.

**48,292.—Gate Latch.—Joseph Leonard, Wilmington, Ohio:**

I claim the two latches, B B', connected by a cord or chain, C, and applied to the gate, A, as shown in connection with the two notched plates, F F', attached to the post, F, and having with respect to each other their lower upper edges, f, at opposite sides of their notches, e, substantially as and for the purpose herein set forth.

**48,293.—Coal and Ash Sifter.—Sebens C. Maine, Boston, Mass.:**

I claim the flanges or strips, e, in combination with the cylinder, B, operating substantially as set forth, for the purpose specified.

I also claim the cylinder, B, provided with flanges, e, in combination with the box, A, hopper, G, and receptacle, E, arranged and operating substantially as set forth.

**48,294.—Mechanical Movement.—Elisha Matteson, South Brooklyn, N. Y.:**

I claim, First, The employment of an inclined disk, D and C', in conjunction with a rolling weight, E, which is connected to a driving shaft in such manner that a rotary motion will be communicated to this shaft by oscillating said disk, substantially as described.

Second, The application of arms, g g', and a pitman, J, to the inclined disk, D, substantially as described.

Third, The combination of the flanged inclined disk, D, roller, E shafts, F G, and a contrivance applied to said disk for oscillating it, substantially as described.

Fourth, Supporting the inclined disk, D, upon a gimbal joint at its center, and upon a base ring or its equivalent at or near its circumference, in combination with a rolling pendant weight, E, substantially as described.

**48,295.—Hair Brush.—John Mayer, Philadelphia, Pa.:**

I claim a hair brush having a tubular handle, provided with any suitable pomade, and constructed so as to operate substantially in the manner and for the purpose described.

**48,296.—Measuring Faucet.—Thomas McGirr, Richmond, Ind., assignor to himself and Nicholas R. Nixon:**

I claim the combination and arrangement of the float, K, stem, J, scale, I, finger, L, all substantially as shown and described.

**48,297.—Door Bolt.—M. McGonnigle, Allegheny City, Pa.:**

I claim the use of two spindles and knobs, in combination with two cams and one spring bolt, constructed, arranged and operating substantially as herein described and for the purpose set forth.

Second, The arrangement of the plate, X, in the end of the case, A, in connection with the thumb screw, 4, opening, 3, and stem, as herein described and for the purpose set forth.

**48,298.—Grubbing Machine.—Charles R. Moffett, Philadelphia, Pa.:**

I claim the lever, A, with its curved end and prongs or teeth, e, combined with the toothed plate, E, as and for the purpose described.

**48,299.—Ash-pan Drawer and Lifter.—James Morrison, Jr., Troy, N. Y.:**

First, I claim the employment and combination of the lifting device, Q, with the said ash pan or box, P, or any equivalents therefor, in the manner and for the purposes substantially as herein described and set forth.

Second, I also claim the lifting device, Q, constructed in the manner and for the purposes substantially as herein described and set forth.

**48,300.—Bottle Stopper.—E. D. Moyer, Philadelphia, Pa.:**

I claim the bottle stopper, described and shown, the same consisting of the cap, A, the elastic water-proof filling, a', and the swinging spring frame, B, the whole being constructed, arranged and combined together so as to operate, when applied to the mouth and neck of a bottle, substantially as described, for the purposes specified.

**48,301.—Rock Drill.—Gregory Mulhaupt, Buffalo, N. Y.:**

First, I claim the combination of the drill stock, B, with a vertically reciprocating frame or cross-head, C, the upward motion of which is produced by the action of the pinion, E, upon the rack, F, or other equivalent means, and the downward motion thereof by gravity, in the manner and for the purposes substantially as described.

Second, The combination of the cam, L, clutch, K, pervion, E, and rack, F, arranged and operating as described, to produce the reciprocating motion of crosshead, C, for the purposes set forth.

Third, Giving an intermittent rotary motion to the drill stock, B, by the upward motion of the crosshead acting on the ratchet wheel, G', through the medium of the cam wedge, J, rock shaft arms, J' J3, and pawl, G, in the manner substantially as described.

**48,302.—Portable Kettle Furnace.—John Murdock, South Carver, Mass.:**

I claim combining with the fire-place, kettle and surrounding cylinder, the two rings, termed the lower and upper rings, to form the two series of flue spaces around the kettle, the lower ring having a flue space through it at one end of the fire-place, and the upper ring a like flue space above the opposite end of the fire-place, and apertures governed by a damper over the flue opening in the lower ring, substantially as and for the purpose specified.

I also claim making the cylinder which surrounds the kettle in two parts, the upper part to receive and support the flanch of the kettle, and the lower part with an inward projecting flanch to form the upper ring, in combination with the ring on which the lower part of the cylinder rests, and which forms what is termed the lower ring, as and for the purpose specified.

**48,302.—Manufacture of Gunpowder.—Francis G. Murray, Washington, D. C.:**

I claim the employment of the with n-described material, compounded as and for the purpose specified.

**48,304.—Weeding Hoe.—John Nangle, Mooresville, Ind.:**

I claim the construction, arrangement and combination of the different parts of the hoe, substantially as described.

Second, The method herein described of fastening the hoe to the shank, as set forth.

**48,305.—Knife-polisher.—Jesse Palmer, Cleveland, Ohio:**

I claim a knife-polisher, constructed and operating as herein described.

**48,306.—Tobacco Dryer.—W. H. Pease, Dayton, Ohio:**

I claim the arrangement of the endless belts, D D, in connection with the tubes or pipes, E, the whole being used and operating as and for the purpose specified.

**48,307.—Halter Clasp.—J. Harden Plumstead, Lynn, Mass.:**

I claim the ring, A, as constructed in combinaton with the clasps, B B, constructed, arranged and operating as described, and for the purposes set forth.

**48,308.—Musketo Bar or Tent.—Amos W. Price, Adrian, Mich.:**

I claim the combination and a rangement of the shaft, a, the slide, e, the braces, b, the arms, c, the joints, d, the connecting plates,

g, the folding in the manner shown, with the netting, f, as and for the purpose specified.

### 48,309.—Fence Gate.—Fitch Raymond and August Miller, Cleveland, Ohio:

We claim the arm, F or J, in combination with the gate, A, cord, f, and weight, g, when combined and operating substantially as and for the purpose set forth.

### 48,310.—Carriage.—Elisha Robbins, Worcester, Mass.:

I claim the application of the thills, or their equivalent, to the axle by hangers or a cranked shaft, as described, and so as to bear against the wagon body, under circumstances and for the purpose substantially as described.

And I also claim the combination of the conical rollers, F G, with their thills, their hangers and the carriage body, arranged and applied together substantially as and so as to operate as described

### 48,311.—Mode of Preparing Roofing Material.—Alfred Robinson, New York City:

I claim the method of coating a sheet or sheets of felt or other material to form a roofing fabric with asphalt or other material in a soft or plastic state, applied directly to such fabric in the manner specified.

### 48,312.—Machine for Cutting Stalks.—John B. Ryder, Wapello, Ind.:

I claim the long journals, B B, the extra wheels, A A, the broad springs, C C, with their sickle-shaped hooks, the adjustable cross bar, D and E, when these several parts are arranged and combined with the main roller, armed with cutters; the whole operating conjointly as and for the purpose specified.

### 48,313.—Connecting Thills to Carriages.—Blaney E. Sampson, Boston, Mass.:

I claim the application of the thills to the arms or journals of an axle by means substantially as described, whereby they may be supported by and turn on such arms while in use.

### 48,314.—Manufacture of Oil Cloth.—George Sampson, Manchester, Me.:

I claim a composition made of glue, gum, or vegetable sising thickened with clay, whiting, ochre, or other earths, for filling or leveling up the surface of the cloth to prepare it for painting or printing.

I also claim mixing clay largely with the oil paint for coating or painting cloths in the manufacture of painted floor cloths.

### 48,315.—Truck for Palling Stones.—Gilbert L. Sheldon, Hartsville, Mass.:

I claim the combination of the secondary truck, A', and wheel B', with the truck, A, frame, K, windlass, I, sheave, L, and chains, M N, constructed and operating substantially as and for the purpose described

### 48,316.—Machine for Cutting and Reducing Vegetables.—Thomas J. Sloane, New York City:

I claim the combination of the series of square or shear-edge cutters on the shaft with the series of square or shear-edged cutters in the case, arranged and operating substantially as herein described.

I also claim sustaining the outer ends of the cutters on the shaft by the rings of the case, in combination with the sustaining of the inner ends of the cutters of the case by the rings on the shaft, substantially as and for the purpose described.

I also claim connecting the cutters with the shaft and with the case, by having the cutters attached each separately by a dovetail or equivalent joint to a ring, and the rings to the shaft and case, substantially as described, to facilitate sharpening and other repairs.

### 48,317.—Pier for Bridges.—Erastus W. Smith, New York City:

First, I claim the employment of calcined plaster, or equivalent expansive material, in stopping the bottom of hollow piers or shells for submarine masonry, substantially in the manner and for the purpose herein set forth.

Second, I claim stopping the bottom of such shells by grouting or flowing the calcined plaster, or analagous semi-fluid material into interstices in previously laid stone, substantially in the manner and for the purpose herein set forth.

### 48,318.—Measuring Faucets.—Joseph Nottingham Smith, Jersey City, N. J.:

I claim introducing the liquid to be measured into the faucet behind a valved plunger, through which it is transmitted in the backward stroke thereof, and by which it is forced out from the faucet in the forward stroke, substantially as and for the purposes herein set forth.

I also claim the outlet valve, U, kept closed by a spring, in combination with the valve plunger of a measuring faucet, substantially as and for the purpose herein specified.

I also claim actuating the plunger by a handle, G, or its equivalent, through the means of a gear wheel, L, and two equal sized pinions, M M, gearing respectively into the plunger racks, N N, arranged and operating substantially as and for the purpose herein specified.

I also claim the adjustable stop, K, on the handle, G, and stationary pins or projections, Y Y, in combination with a measuring faucet for gaging the amount of liquid drawn by rock movement of the handle.

I also claim the registering dial, H, and index, h, arranged in combination with the actuating handle so as to indicate and register the whole amount of liquid drawn from the cork or vessel, substantially as herein specified.

I also claim the combination and arrangement of the plunger in relation to the operation of its valve and packing, substantially as and for the purposes herein specified.

I also claim, in combination with a measuring and registering faucet, lining the body of the faucet with tin, brass, or other suitable soft metal or alloy, backed by a cement of hydraulic lime, plaster of Paris, or equivalent substance, so that the lining may be removed and replaced when desired, substantially as herein specified.

### 48,319.—Mode of Packing Grindstones.—Frank M. Stearns, Berlin, Ohio:

I claim the rods, A and B, in combination with the end boards or heads, C C, in the manner described and for the purpose set forth.

### 48,320.—Tobacco Pipe.—John D. Stewart, Baltimore, Md.:

I claim constructing the hinged cover of a tobacco pipe of an inner disk, b, and a bulging outer portion, a, when the said cover contains within the same a spring, d, connected with a rod, g, of a follower or tobacco presser, c, all arranged and operating substantially as herein set forth.

### 48,321.—Steam Engine.—O. M. Stillman, Westerley, R.I.:

First, I claim the jacket, E, and cylinder, G, constructed and arranged as described, in combination with the superheater, C, through which the steam passes on its way to the jacket, substantially as and for the purpose herein set forth.

Second, I claim the within described arrangement of the steam jacket, E, and cylinder, G, whereby the steam is compelled to flow uniformly, or nearly so, over the cylindrical surface and through one or both heads of the cylinder, in the manner and for the purpose substantially as herein set forth.

Third, I claim the within described arrangement of the superheater, C, the automatic regulator, N, and its connections, the steam jacket, E, and the cylinder, G, so as to operate together, in the manner and for the purpose substantially as herein set forth.

Fourth, I claim the incombustible clothing, K, the jacket, E, cylinder, G, and superheater, C, arranged to operate together substantially in the manner and for the purpose herein set forth.

### 48,322.—Gate.—William Tallman, Manteno, Ill.:

I claim the combination of the gate, A, constructed as above set forth, and resting at one end on a roller, with posts, B B', set in relation to each other as shown, and operating as described.

### 48,323.—Paint for the Bottoms of Ships.—James Gamage Tarr and Augustus Henry Wonson, Gloucester, Mass.:

We claim an improved composition, formed essentially as set forth and for the purpose specified.

### 48,324.—Cultivator.—H. M. Teasdale, Dansville, N. Y.:

First, I claim the aarangement of the inclined wings, E' E', with the double plow, E, and the beams, D D, in the manner and for the purpose described.

Second, The construction of the point represented in Figs. 4 and 5, in combination with the parts, E b d, substantially as and for the purpose herein described.

### 48,325.—Cloth Registering Attachment for Looms.—C. C. Temple, Saco, Me.:

I claim the registering mechanism herein described, consisting of the wheel, b, provided with projections to seize the fabric, worm wheels, d h and l, endless screws, c k and g, and disks, j f and n, substantially as and for the purposes herein set forth.

[The object of this invention is to control the operatives employed in factories where cloths and other textile fabrics are produced, and prevent them from taking away feloniously certain portions of such fabrics.]

### 48,326.—Grain Huller.—James H. Thompson, Hoboken, N. J.:

I claim the combination of the inverted, fluted, conic frustrums, D, conical case, B, and lateral projections or prominences, c e c, all constructed and arranged and operating substantially as specified.

### 48,327.—Joint of Folding Rules.—Justus A. Traut, New Britain, Conn.:

I claim the slit, C, in the center piece, a', of the joint, a, for the purpose of receiving a device for producing tension or rigidness, substantially as and for the purpose described.

Second, I claim the employment of a metal piece, d, or its equivalent placed in the slits of the joint, a, substantially as and for the purpose described.

### 48,328.—Composition for Stiffening Hat Bodies.—T. Trowbridge, Danbury, Conn.:

I claim the within described composition made of the ingredients specified, substantially as set forth.

[The principal object of this improvement is to provide a stiffening composition for hat brims, and analagous articles, which shall quickly set or become stiff, after it is applied, and thus render the hat brim rigid. The improvement is also applicable to many other useful purposes.]

### 48,329.—Grain and Grass Seed Separator.—James B. Wallace, Franklin, Ohio:

I claim the employment or use of a series of screws connected together as shown and suspended within a suitable frame on a square shaft which is supported by adjustable bearings or blocks, E E, all arranged to operate in the manner substantially as and for the purpose herein set forth.

[This invention consists in the employment or use of a series of screws connected together and arranged within a frame, in such a manner that grass seed and other foreign substances may be separated from grain and the grass seed also separated from the worthless foreign substances.]

### 48,330.—Device for Unloading or Storing Freight.—Henry A. Whitney, Brooklyn, N. Y.:

First, I claim the elevated ways, A A, arranged in the manner shown, to admit of being adjusted in an inclined position for the movement of the car or truck, B, on the ways for the purpose specified.

Second, In combination with the above I claim the suspended hoisting device G H J, with the platform, I, attached.

### 48,331.—Steam Pressure Gage.—James P. Wigal, Neago, Ill.:

I claim the coiled auger-shaped tube, B, in combination with the plug, A, arm, d, segment, f, pinion, h, and index, l, constructed and operating substantially as and for the purpose set forth.

[The operation of this steam gage is based on the property of a flat coiled tube, whereby the same when closed at one end and charged with fluid under pressure, will slightly uncoil and as soon as the pressure on the fluid ceases the tube returns to its original position. By attaching to the closed end of the coiled tube a long arm which connects by means of a toothed segment and pinions with a central arbor carrying an index hand the slight motion which said tube assumes when exposed to the action of fluid under pressure, is multiplied to produce the required motion of the index head and a scale is obtained on the dial plate sufficiently open to distinguish slight changes in the pressure of the fluid.]

### 48,332.—Haming Mills.—Warren Wright, Springfield, Ohio:

First, In combination with diaphragms, G, the series of screws, H, formed so as to be cast in entire cylinders having the longitudinal slits, h, from their lower to near their upper margins, substantially as set forth.

Second, The series of symmetrical equal annular and two parted diaphrams G G' G2, capable of transposition and reversal, substantially as and for the purpose set forth.

Third, The provision of the lip, g' or lips g and g'', at the interior margin of the annular diaphragms G G, G2, for the purpose explained.

Fourth, The enclosing case composed of a series of entire cylindrical screens, H H' E2 and marginally grooved annular diaphrams, G G' G2, as represented.

Fifth, In the described combination with the series of diaphragms, G G' G2, having equal central apertures, I claim the floating suction heater, L, M, substantially as set forth.

Sixth, The arrangement of diaphragms, G G' G2, having equal central apertures in combination with the flaring and vertically adjustable suction beater, L M, substantially as set forth.

### 48,333.—Fire Escape.—Robert Wyatt, Brooklyn, N. Y.:

First, The combination of the vertical slotted tube, A A A4, the bar, g, and the hinged rounds, h h, substantially as herein described the whole forming a folding fire escape ladder.

Second, The bar, D, caton, f, and cap, C, in combination with each other and with the slotted tube A A' A4, bar, g, and hinged rounds, h h, substantially as and for the purpose herein specified.

### 48,334.—Raising and Lowering Signal Lamps.—Thomas G. Crosby (assignor to George H. Strong and M. H. Crosby) Buffalo, N. Y.:

I claim the rods or slides, A B, or their equivalent in combination with the rope or cord, M, the pulley, I, or its equivalent and the frame, J K, for hoding the lamp when constructed to operate as herein substantially set forth and described.

### 48,335.—Harvesting Machine.—J. L. Fountain (assignor to himself and A. Fountain) New Milford, Ill.:

First, I claim the arrangement of the link, g, arms, e and f, link, i and p, in combination with the piece, E, of the mowing frame, and guides, d d and b, substantially as and for the purpose described.

Second, I claim the rod, n, and lever, h', in combination with the lever, n', pulley N, and belt, l, as and for the purpose set forth.

Third, I claim the adjustable arm, J, and guides, J', in combination with the pulley lever n', and shoe as and for the purposes described.

Fourth, I claim the peculiar arrangement of the pulleys, G, h'' g' and l, in combination with the reel standard, F, piece, F', when operating conjointly as and for the purpose set forth.

### 48,336.—Tackle Hook.—Russel Frisbie (assignor to Ira K. and Elmore Penfield) Middletown, Conn.:

I claim a strap which swivels on the shank of a tackle hook and is made in two parts that are hinged together in combination with a spring bolt, constructed and operating substantially as and for the purpose set forth.

[This invention consists in a strap which swivels on the shack of a tackle hook and which is made in two parts united by a pivot in combination with a spring bolt which locks into a notch on the tip of the hook in such a manner that when the strap is locked to the tip, the hook is effectually closed and prevented from unhooking spontaneously and by pressing back the bolt the strap can be readily unhooked and turned up so as to open the hook at any moment. Furthermore by the use of this strap the hook is prevented from straightening out and it is capable of sustaining a much greater strain than it would without the strap.]

### 48,337.—Cartridge Retractor for Breech-loading Fire-arms.—Joshua Gray, Medford, Mass., assignor to himself, E. H. Eldredge, of Boston, Mass., and S. S. Bucklin, Providence, R. I.:

First, I claim the cartridge extractor, C, provided with the slot, f, in combination with the guide and expellor, B, substantially as and for the purpose described.

Second, The sliding breechpin, D, extractor, C, and guide and expellor, B, when constructed, combined and operating substantially as described.

### 48,338.—Hand Stamp.—Thomas S. Hudson and Anthony Hardy (assignor to Thomas S. Hudson) Cambridge, Mass.:

First, We claim the combination of the endless chain of types and its carrying mechanism with the plunger.

Second, We claim the combination of the endless chain of types and its carrying mechanism with the plunger and the chase, the whole being arranged together as specified.

Third, We also claim the combination of the endless chain of types and its carrying mechanism with the chase, the plunger and printing ribbon arranged as specified.

Fourth, We also claim the combination of the type chamber, d, in the neck, e, of the frame with the endless chain of type, its carrying mechanism, the chase and the plunger arranged to operate as described.

Fifth, We also claim the combination of one or more elastic cushions or masses of vulcanized india-rubber, s s, with the frame and plunger of the press such cushion or cushions being arranged on the bottom of the said frame and for the purpose as explained.

We also claim the combination of the catch wheel, o, and spring catch, p, with the endless type chain its sprocket wheels, the chase and the bed arranged so as to cooperate as specified.

### 48,339.—Device for releasing Screw Engines, Etc.—Antona Kieffer (assignor to himself and James Kennedy) Buffalo, N. Y.:

I claim the counterbalanced pawl, D, provided with a pawl rod, F, in combination with the toothed wheel, B, and prying off lever, C, for the purposes and substantially as described.

### 48,340.—Argand Gas Burner.—Charles H. Johnson (assignor to himself and Eugene Woodman) Boston, Mass.:

I claim the arrangement and combination of the foraminous partition, e, with the tip, b, its chamber, a, and the conduits leading into and out of such chamber.

I also claim the combination of the tip, b, with the groove, f, in its upper surface or end or with the said groove, f, in its upper surface or end and also with another groove, g, arranged in its lower surface or end.

I also claim the tip as made with each of its jet holes countersunk at either or both of its extremities, and for the purpose specified.

I also claim the tip, as made with a groove, f, in its upper surface or end, and with each of its jet holes countersunk at its upper end.

I also claim the tip as made with a groove, f, in its upper surface or end, and with each of its jet holes countersunk at both of its extremities.

### 48,341.—Bottle Stopper.—Wilhelm Kloenne (assignor to himself and G. Hubner), New York City:

I claim a bottle stopper, composed of a plug, A, spring valve, B, and elastic tube, C, substantially as herein set forth.

[This invention relates to a bottle stopper, composed of a plug of wood or other suitable material, perforated through its longitudinal center, in combination with a cone valve secured to a stem, which passes through the hole in the plug, and with its elastic tube applied to the outside of said plug in such a manner that when the plug with the elastic tube is inserted in the neck of a bottle containing liquid under pressure, the pressure of the gases in the liquid forces the cone valve up into the elastic tube, and expands the same, causing it to close tight against the inner surface of the neck.]

### 48,342.—Sectional Folding Boats.—Joseph H. Laning and Veron Fletcher, Philadelphia, Pa., assignors to Veron Fletcher. *Antedated June 15, 1865:

We claim the peculiar manner of constructing boats of movable and adjustable sections, so connected with hinges, part thereof affixed on the inside of the boat, and part thereof on the outside, so as to move in harmony with each other, whereby the boat can be opened and closed at will.

We also claim the combination of hinges, vulcanized india-rubber tubing, and movable and adjustable sections, for the purpose of as hereinbefore more fully set forth, and substantially as described in both clauses.

### 48,343.—Machine for Boring Artesian Wells.—Thomas J. Lovegrove, Philadelphia, Pa., assignor to himself and Henry Baldwin, Jr.:

I claim, First, Vibrating the mechanism which supports, raises, lowers, feeds and rotates the drill directly over the hole, so as to dispense with a derrick.

Second, Rotating the drill automatically by mechanism actuated by the vibration of the parts which sustain it, substantially in the manner described

Third, A mechanism which automatically and simultaneously vibrates, feeds and rotates the drill.

Fourth, Connecting one end of a walking beam or vibrating lever to the motor, and the other to the drill, by mechanism which gives the drill an intermittent axial rotation.

Fifth, Combining with a walking beam or vibrating lever a mechanism actuated by the reciprocation of the beam intermittently to rotate the drill, and a mechanism similarly actuated for raising and lowering and feeding the drill.

Sixth, Combining with a vibrating mechanism which supports and rotates the drill, a mechanism independent of the vibrations of the beam, to raise or lower the drill.

Seventh, Controlling the feed of the drill by the differential movement of the rotating and lowering mechanism.

Eighth, A drill-rope spool rotating both on a vertical and a horizontal axis, and having a vertical reciprocation.

Ninth, making the fulcrum of the walking beam the axis of motion, upon which the mechanism is supported for rotating the drill automatically, and raising and lowering it, substantially in the manner described, for the purposes set forth.

### 48,344.—Steam Engineer Governor.—Thomas J. Lovegrove (assignor to himself and Henry Baldwin, Jr., Philadelphia, Pa.:

I claim, First, The employment of the single closed chamber in a governor to contain crude mercury to control the engine, substantially as described.

Second, Supporting a valve stem in a single closed chamber upon crude mercury, so that the valve shall close when the mercury is at rest in the chamber, and open when the mercury is diffused by centrifugal motion over the chamber and float, substantially in the manner described.

Third, The revolving closed chamber to contain mercury, combined with a float, to be operated by the mercury, substantially in the manner and for the purpose set forth.

Fourth, The combination of the sleeve, E, the revolving chamber, H, the float, J, and the valve stem, L, substantially in the manner and for the purposes set forth.

### 48,345.—Sewing Machine.—John McClosky (assignor to himself and Samuel B. Ballou), New York City:

I claim the hook, A, constructed and applied to operate substantially as herein described, in combination with the rotating hook, C, bobbin, B, and needle, for the purpose herein set forth.

### 48,346.—Bit Stock.—Milton V. Nobles, Rochester, N. Y., assignor to himself and John C. Nobles, Rushford, N. Y.:

I claim the combination of the uncut or solid socket with the split ferrule, ring and catch, by which the bit or other tool may be firmly held in the stock, and readily released therefrom, substantially as described.

### 48,347.—Paper-making Machine.—James Scanlan (assignor to himself, S. J. Stine and George Ross), Lebanon, Pa.:

I claim, First, The couching roller, A, with its lever attachment, S S' R, in combination with the Fourdrinier wire cloth apron, U, situated and operating in the manner and for the purpose specified.

Second, I claim the third felt, in combination with the wash box, L, its washers, V, racks, N, and rollers, 1 2 3 4 5 6 7 8 9 and 10, arranged and operating substantially as set forth.

I claim also the polishing roller, I, in the second press, in combination with the press rollers, G H.

I claim the combination of the Fourdrinier machine for making paper boards out of straw, sogium or other material, in combination with my third felt and felt-washer arrangement, as described

48,348.—Machinery for Oiling Wool.—John Shim, Leverington, Pa., assignor to himself, Geo. S. Harwood and Geo. H. Quincy:

First, In wool-oiling machinery, I claim the combination of the bed, a, and grooved roller, b, revolving inside of the tank, as and for the purpose described above.

Second, I claim an endless cloth of wire, or a pressure roller covered with wire, mounted just above the feed cloth, to receive the oil after being discharged from the tank, and convey it to the wool on the feed cloth, as above described.

48,349.—Saw-mill.—Wm. A. Wright and James Molyneux, Bordentown, N. J., assignors to the Bordentown Mach. Co*:

We claim, First, The frame, E, its teeth, a, the worm, b, saw frame, G, pitman, f, driving shaft, H, crank, h, the whole being arranged for joint action, and in respect to the stationary frame, as and for the purpose herein set forth.

Second, The movable table, I, with its roller, K, in combination with the movable frames, E and G.

Third, The roller, K, its ratchet wheel, the plate, L, and pawls, m, and wheel, b, or its equivalent, the whole being arranged and operating substantially as and for the purpose herein set forth.

48,350.—Apparatus for Deadening Sound.—Francis Fearon, London, Eng.:

I claim the exclusive use of an apparatus for softening or deadening sound, by means of pressure on the tragus of each ear, substantially as herein described and illustrated by the drawing.

48,351.—Apparatus for Oiling Wool, Etc.—Martyn J. Roberts, Pendarren House, Crickhowell, South Wales, Eng. Patented in Belgium Oct. 29, 1863:

I claim, First, A reservoir, in combination with revolving blades and a trough or gutter, the three being constructed and operated substantially as described.

Second, In combination with a perforated revolving disk or sprinkler, a tube or passage way leading to the disk, a gutter supplying liquid to the passage way and revolving blades for raising liquid into the gutter, all these parts being and acting in combination as described.

Third, A revolving sprinkling disk, in combination with a cover and a slotted pan, I claim a tube and a reservoir provided with a partition, as described, these parts being constructed and operating in combination, substantially as set forth.

And, last, I claim, in combination the following parts, when constructed and operating substantially as set forth, viz: 1st, A reservoir, provided with a gutter and a partition; 2d, revolving blades; 3d, a revolving sprinkler supplied by the gutter; 4th, a roof and a slotted pan, and 5th, a tube extending from the pan to the reservoir.

48,352.—Apparatus for Impregnating the Air of Rooms with Antiseptic Vapors.—Antoine Joseph Sax, Paris, France:

I claim an apparatus composed of the reservoir, A, and movable and adjustable impregnator, B, substantially as herein described, for the purpose of impregnating the air of rooms, hospitals and other buildings with the vapor of antiseptic substances, as herein described.

## REISSUES.

1,999.—Shears.—Joel Bryant, Brooklyn, N. Y. Patented Sept. 22, 1863. Antedated June 29, 1863:

I claim the construction and exclusive use of shears and scissors (Figs. 1 2 3 4 and 5), whose blades are secured, and whose rivets, R, are so set as to cause the edges of the said blades, B, to meet and close below the line, R, of their rivets, substantially as herein described and for the purposes set forth in this specification.

2,000.—Gas and other Retorts.—John Chilcott, Brooklyn, N. Y. Patented Jan. 17, 1865. Antedated Jan. 6, 1865:

I claim, First, Surrounding one or more gas or other retorts with a continuous system of flues, E E, through which the flame and gaseous products from the furnace circulate back and forth several times along and once all around the retort or retorts, substantially as and for the purpose herein set forth.

Second, The jacket or casing, C, divided longitudinally into two parts, and having the flue partitions attached to its interior, so as to be detachable from the retort, substantially as and for the purpose herein specified.

2,001.—Brewer's Boiler.—Adolph Hammer, New York City. Patented Aug. 11, 1857:

First, I claim arranging the steam pipe in boiling apparatus in two or more distinct and separate parts or series, each of which can be turned up or rotated, substantially as and for the purpose set forth.

Second, Rotating the parts or sections of a steam pipe in a boiling apparatus upon an axis at or near the center of the tub, substantially as and for the purpose specified.

2,002.—Mash Tun.—Adolph Hammer, New York City. Patented Jan. 9, 1855:

First, I claim the application and use of the upper rake, constructed substantially as described, when combined with a mash tun, so as to be rotated in opposite or in the same direction to that of the usual rake, substantially as and for the purpose set forth.

Second, Making the rake teeth of the tun inclined, substantially as and for the purpose described.

Third, Curving the teeth of the rake of a mash tun, substantially in the manner and for the purpose specified.

Fourth, The use of inclined curved teeth in the rake of a mash tun, substantially as and for the purpose set forth.

2,003.—Hoisting Machine.—Wm. Miller, Cincinnati, Ohio. Patented May 12, 1863:

First, I claim combining with the platform of a hoisting machine or elevator, a worm wheel, J, gearing with a corresponding worm rack, D, substantially as set forth.

Second, In combination with the described or equivalent actuating mechanism, H I J, and platform, B, I claim the arrangement of the worm racks, D D, and worm wheels, J J', the whole being combined and operating substantially as set forth.

2,004.—Street Washer.—Joshua Regester, Baltimore, Md. Patented July 23, 1861:

First, I claim so applying a stop cock within a metallic case that the cock and case are united together, and the cock and its key rod or discharge pipe supported permanently in position within the case, substantially as described.

Second, A stop cock for street washers, having an upper and a lower support, which serve to sustain and center the cock and key rod or discharge pipe, applied therein to turn the water on and off, substantially as described.

2,005.—Enema Syringe.—Francis B. Richardson, Boston, Mass. Patented March 5, 1861:

I claim so forming the connection between the bulb and its flexible tube that the bulb can be used separately with a jet pipe, as well as with its flexible tube, thus adapting the syringe to all the various operations for which it may be required, as described.

2,006.—Button.—Charles Smart, New York City, assignee by mesne assignments of Geo. A. Meackam. Patented Jan. 10, 1860:

First, I claim a button revolving, or its shank or stem, by means of devices, substantially as hereinbefore set forth.

Second, I also claim the teeth, a, arranged at the base of the shank, A, substantially as and for the purpose hereinbefore set forth.

2,007.—Harvester.—Wm. Cogswell and Wm. H. W. Cushman, Ottawa, Ill., assignees by mesne assignments of Wm. H. and Ira Cogswell, Jr. Patented Dec. 6, 1859:

We claim the combination with the pinion, I, rotating in a fixed bearing in the frame, and a driving wheel, provided with gearing, G and H, we claim the hand lever, F, and eccentric journal D, adapted to move the driving wheel forward and backward, so as to bring either of the said gears, G or H, into engagement with the said pinion, or equidistant from it, and out of gear, substantially as described.

2,008.—Machine for Finishing Nuts.—Frank P. Pfleghar and Wm. Senolihorn, New Haven, Conn. Patented Oct. 25, 1864:

First, The combination of reamer, D, punch or punches, E, milling tool, F, and tap or taps, G, constructed to operate substantially as specified, whether arranged in the order described or not, when the said combination exists in an organized machine, which receiving a blank metal nut finishes it complete while passing through the said organized machine.

Second, The use of milling tools, F F*, arranged substantially as herein specified, for the purpose of finishing the faces of a nut.

Third, The steps, e, in the channel, C, arranged substantially as and for the purpose set forth.

Fourth The reversing gear, I I J, clutch, K, and switch lever, L', or their equivalent arrangement, in combination with the wheels, b F3 h, which impart motion to the various tools, in the manner and for the purpose substantially as herein specified.

Fifth, The adjustable shoulders, l l', applied in combination with the switch lever, L', and with the reversing gear, substantially as and for the purpose herein described.

Sixth, The automatically reciprocating rod, p, and finger bar, g, applied in combination with the channel, C, and tools, D E E* F F* G G*, in the manner and for the purpose substantially as described.

Seventh, The arm p3, and inclined plane, r, in combination with the reciprocating rod, p', finger bar q', and channel, C, constructed and operating substantially as and for the purpose set forth.

2,009.—Clover and Grass Seed Harvester.—William N. Whiteley, Jr., Springfield, Ohio, assignor to Thomas S. Steadman, Murray, N. Y. Patented May 23, 1854. Reissued June 19, 1860:

I claim, First, The combination of the holding plate, e, or its equivalent, with the shaft of the driving cog wheel's pinion, and that end of the coupling arm or supplementary frame, G, or its equivalent, which is hung and vibrated on said shaft.

Second, The combination or arrangement of the following elements in a harvester, viz.: a frame or box, having the cutting apparatus connected to and drawn forward by it; the shaft of the main driving cog wheel's pinion, also connected to it, and about at right angles to its forward movement; a coupling arm or supplementary frame, or its equivalent, having one end hung and vibrated on said pinion shaft, and near the other end connected to the axle of the main driving cog wheel, and a holding device whereby the attendant can have the inner end of the cutting apparatus held at different hights in respect to the axle of the main driving cog wheel.

Third, Connecting the main bearing and driving wheel of a harvester with the frame to which the cutting apparatus is attached, in such a manner that the attendant can, while riding on the machine, vary the hight of the inner end of the cutting apparatus, while the outer end of said apparatus remains unchanged, substantially as described.

Fourth, The combination of the retaining and guiding arc, g2, or its equivalent, with the axle end of the coupling arm or supplementary frame, H, or its equivalent, the outer end of a harvester's cutting apparatus, and the wheel that carries this outer end or is nearest to it.

Fifth, The combination of the axles, f and d, the wheels, C and D, the projecting ends of the shaft of the main driving cog wheel's pinion, the frame or box carrying this shaft, the coupling arms or supplementary frames, G and H, the holding plates, e e, and the retaining and guiding arcs, g and g2, or their equivalents.

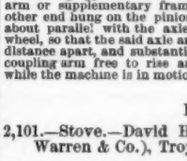
Sixth, The combination or arrangement of the following parts or elements in a harvester:—A frame or box which carries the shaft of the cutters' main driving cog wheel's pinion; a coupling arm or supplementary frame, having the axle of the said cog wheel connected to it at or near its outer end, and the inner end hung upon said pinion shaft; a holding device, by which it is properly held in that place; a guiding and retaining arc attached to the main frame of the machine, and maintaining the supplementary frame or coupling arm in place; cutters driven by a crand motion, and an automaton rake, which, as well as the cutters, receives its motion through the main driving cog wheel's pinion shaft.

Seventh, Connecting the axle of the cutter's first driving cog wheel and said wheel's pinion shaft by the coupling arm or supplementary frame, G, or an equivalent thereof, which has one end hung on said pinion shaft, and therefore holds the said cog wheel's axle always at the same distance therefrom, so that the connection of the said cog wheel and its pinion will always remain the same.

Eighth, The combination of the retaining and guiding arc, g, or its equivalent, with the main frame or box of a harvester, to which the cutting apparatus is secured, and the axle end of the coupling arm or supplementary frame, G, or its equivalent, which has the other end hung on the pinion shaft connected to the main frame about parallel with the axle of the cutter's ground and driving wheel, so that the said axle and pinion shaft are always at the same distance apart, and substantially parallel, and the axle end of said coupling arm free to rise and fall, vibrating on said pinion shaft, while the machine is in motion.

## DESIGN.

2,101.—Stove.—David Hathaway (assignor to Fuller Warren & Co.), Troy, N. Y.

# PATENTS

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FOR SEVENTEEN YEARS.

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In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-HALF of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *eighteen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from ex-Commissioners of Patents.

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

[See Judge Holt's letter on another page.]

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

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The service which MESSRS. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of MESSRS. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No 37 Park Row, New York.

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Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention; the Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

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Every applicant for a patent must furnish a model of his invention is susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of MESSRS. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

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| | |
|---|---|
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| On filing each application for a Patent, except for a design | $15 |
| On issuing each original Patent | $20 |
| On appeal to Commissioner of Patents | $20 |
| On application for Re-issue | $30 |
| On application for Extension of Patent | $50 |
| On granting the Extension | $50 |
| On filing a Disclaimer | $10 |
| On filing application for Design (three and a half years) | $10 |
| On filing application for Design (seven years) | $15 |
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INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

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Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. MESSRS. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort of extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

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Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model, is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York

## Notes and Queries

J. W. P., of Mich.—We do not know where you can obtain a windmill capable of doing the work you desire. If any of our readers can furnish a good wind power we think it would pay them to advertise it in the SCIENTIFIC AMERICAN.

R. J. W., of Mo.—The ear pieces to assist in hearing were at one time sold in this city, but we do not think they were as good as the common ear trumpet.

F. L. H., of Mass.—Telegraph wires have been tapped during the war, by cutting the wire and connecting one of the cut ends to one end of the helix of an electro-magnet and the other to the opposite end of the helix. Then when the current is closed the armature will be attracted, and when it is broken the armature will be released, the same as at any of the telegraph stations.

P. A. H., of Ill.—You may filter the water for your cistern by running it into a long trough and laying in the trough a drain pipe so arranged that the water must pass through its walls. Or you may make a filter by boring numerous holes in the bottom of a hogshead, covering the bottom with flannel, and filling in sand to the depth of a foot or two.

S. G. S., of Pa.—No person has a right to make a patented invention for his own use without the inventor's consent. The present volume closes on the first of July. We can furnish early in July a few of the present volume bound.

A. E. T., of Ohio.—India-rubber bottle stoppers are in use to some extent. We have often seen them.

A. H., of Pa.—We have never seen a passenger indicator constructed like the one shown in your sketch and should think it could be patented.

H. H., of D. C.,—The muscular power of a man is equal to one-eighth of a horse power, and we have no doubt that an engine of one-eighth horse power might be constructed to weigh not more than 150 lbs.

F. H., of N. Y.—We think the colapsing tubes such as are used by artists, are made in France, and are not patented in this country.

P. P. H., of Conn.—It is doubtless the molasses in your smoking tobacco which makes it continually damp. Molasses is hygrometric or has the property of attracting moisture from the atmosphere; it is often employed in curing tobacco.

L. T., of N. Y.—We know of no exhaustive, recent work on the steam engine. Locomotives have been very fully treated by both Clark and Colburn, and perhaps you might find what you want in "King's Notes on the Steam Engine."

W. R., of N. Y.—Zinc is very volatile, and has a strong affinity for oxygen, especially at high temperatures; if therefore molten zinc is exposed to the air in an open vessel it rapidly wastes by two processes—by evaporation and oxidation, hence the necessity of covering the surface by a protecting stratum of some other substance.

P. D., of N. Y.—We enjoyed reading your letter heartily, but cannot publish it for the reason that personal and private disagreements are of no interest to the general public. We shall publish your engraving very soon. The engine makes a handsome appearance and we hope it will be successful.

Romanus, of Ohio.—The melting point of copper is stated at 2143° Fah., and of silver at 1873°, but there is no instrument for measuring these high temperatures which is universally regarded as trustworthy. You had better buy a crucible than attempt to make one.

J. C. S., of N. H.—In regard to the sale of your planetary discoveries we cannot offer any advice. It is a business in which we are not engaged.

H. A. S., of Me.—We cannot instruct you by a receipe how to enamel cloth. You must learn the art by practice.

H. C. S., of Ind.—India-rubber cement is what you require. See directions for making it in our last volume.

L. W. W., of Ill.—For the price of Roper's air engine, address Crosby, Butterfield & Haven, 22 Dey street, New York.

J. E. B., of N. Y.—We published a very full description of the new Atlantic telegraph cable in our last volume.

E. W. C., of Ohio.—The best method of making wood soft and limber is to heat it in a close vessel by means of steam Prepared in this way timbers a foot square may be bent in short curves at right angles.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgement of our receipt on of their funds


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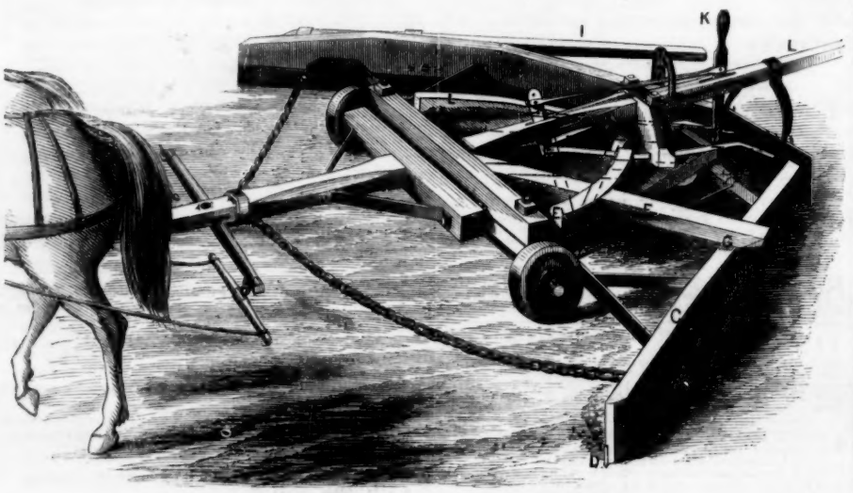
Turnpike roads present an animated appearance in the spring when men and teams turn out to repair the damage done by frost and thaw. For many years the only reliance and the most serviceable implement in use for this purpose, has been the common scraper or scoop, to which horses are attached. This being held by main strength against the soil, scoops up great loads of earth which are afterward dumped by turning the whole concern upside down at the proper time—certainly a rude and clumsy device. It is not only inefficient, but very hard to use, as the aching hands and back of many a farmer can testify, who works out his tax, as many do, on the road.

The machine herewith illustrated is a vast improvement on the old-fashioned scraper, since it leaves the




MORE'S ROAD SCRAPER AND GRADER.

road smooth and even, and can be worked with great ease and celerity. It takes the dirt from both sides of the road, where it is not wanted and heaps it in the middle where it is, and is provided with various attachments to perform the work properly.

In the engraving, A is a triangular frame supported by two wheels forward, and one in the center behind. This frame has two stout rods, B, which serve as hinges for the scrapers, C. The scrapers are strong pieces of plank, shod with steel, D, and fitted with braces on which they turn like a door when desired. To the frame, A, are attached guards, E, under which are bars, F. These bars are jointed at one end to the frame, so that they can be swung out over the scrapers to keep them down, as at G. One of the scrapers is jointed on the middle, as at H, and is furnished with a lever, I, by which it can be lifted, so that its bottom, where it touches the road, is arched in form; thus allowing a ridge to be left on the road at any point independent of the dirt thrown up at the middle. This is sometimes necessary on account of the bad nature of the highway. To fill up holes and ruts there is a door, J, at the back of the machine, which is worked by the lever, K, when the dirt thrown to the center by the scrapers has to be deposited. The whole hinder end can be raised by the bar, L, when any considerable object is met, which cannot be passed over otherwise.

If it is required to use one side of the machine (one scraper only), this can be done, and the other one turned up over the main frame, as shown by the dotted lines. When this occurs there would be a tendency on the part of the machine to slew around sideways, unless some means were adopted to prevent it. A rudder or share is, therefore, provided below the frame, to enter the ground near the center of the draft, and thus steady it when working as described. When proceeding to and from the field, both scrapers are turned up out of the way over the frame.

It sweeps over a space of 11 feet in width with both scrapers down, and 5 feet with one down; and can be worked from five to ten miles per day according to the condition of the road. The weight on the scraper can be regulated at will, even when working, and the machines can be made in any style to suit any roads.

This scraper was patented on July 5, 1864, through the Scientific American Patent Agency, by Edward H. More, of Moresville, Delaware Co., N. Y.; address him at that place for further information.

### Science Abroad.

Some interesting papers have been recently read before the French Academy. Among them is one by M. Becquerel, senior, on "Forests, and their influence on Climate." The first part of the memoir reviews the *deforesting* effect of civilization, whilst the second part examines the influence of forests upon climate. The influence which they possess is extremely complex, depending on—1, the size of the forests; 2, the height of the trees and their nature, whether deciduous or not; 3, the power of evaporation from their leaves; 4, the property which they possess in common with other bodies of heating or chilling the air; 5, the nature and physical state of the ground and of the subsoil. This last division is one of the most important, as it affects the supply and distribution of streams. In plates annexed to this paper, M. Becquerel has graphically shown the population from 1801 to 1861, and the amount of wood and charcoal consumed in Paris from 1800 to 1864. Great Britain, the author remarks, has only two per cent of forest land, Spain three per cent., whilst France has 16·7 per cent. He states in conclusion, that the climate of a country can be improved by cultivating the land, draining marshy districts, and planting trees on mountains and on all ground not used for agricultural purposes. The subject is one of interest in this country, where from our constant destruction of wood, we are changing seriously the climate, and lessening the steady supply of water in our rivers.

Also one by M. Pelouze, on "The Action of Metalloids on Glass, and the Presence of Alkaline Sulphates in Glass." The author finds that—1. All commercial glass contains sulphates. 2. Glass made from materials not containing sulphates is not colored by carbon, boron, etc. 3. Sulphur and sulphurous minerals impart a yellow color to pure glass. 4. The color produced in glass by metalloids is entirely due to their reducing power.

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